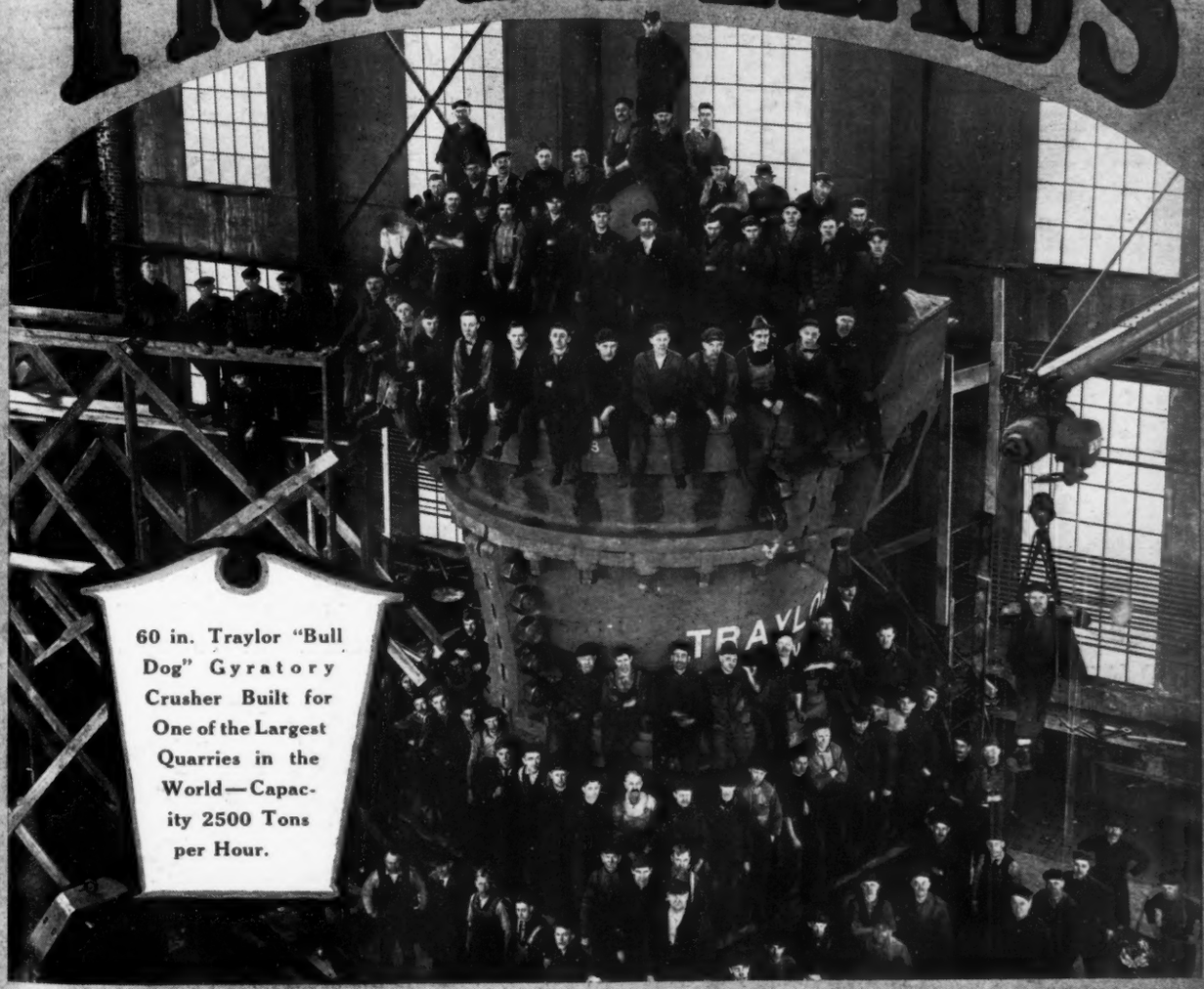
LIBRARY
RECEIVED
MAY 26 1919
U.S. Department of Agriculture

Rock Products

$2.00 A YEAR | CHICAGO | MAY 24, 1919

TRAYLOR LEADS



60 in. Traylor "Bull Dog" Gyratory Crusher Built for One of the Largest Quarries in the World—Capacity 2500 Tons per Hour.

TRAYLOR ENGINEERING & MFG. CO.
Allentown, Penna.
NEW YORK CHICAGO LOS ANGELES SPOKANE

for 5 years the elements tried to destroy it—but today it is as good as new

A Keystone Kiln has stood—with top uncovered—since 1914 at a deserted quarry of the Montgomery Lime Company in Houchins, Va.

Today it is being moved sixty miles to a new location by the Kimbalton Lime Co. It is as good as new!

So satisfactory was its performance during the nine years of actual use that the Kimbalton Lime Co. has ordered a sister kiln to meet increased-production plans.

Keystone Kilns

Here you have proof of singular durability and working merit. And note that the Keystone can be moved. This can be done with no other kiln.

236 Kilns in Use to Date

Steacy-Schmidt Manufacturing Co.
York, Penna.

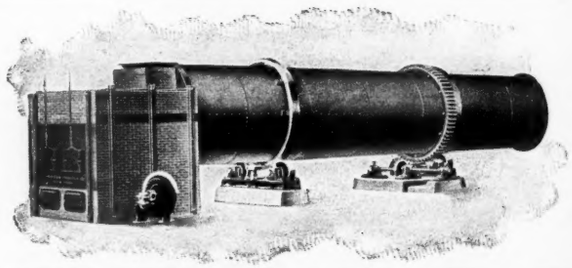
"PENNSYLVANIA" Hammer Crushers

For Crushing and Pulverizing Lime, Limestone, Gypsum, Marl, Shale, Etc. Main Frame of Steel, "Ball and Socket" Self Aligning Bearings; forged Steel Shaft; Steel Wear Liners; Cage adjustable by hand wheel while Crusher is running. No other hammer Crusher has such a big Safety Factor.

PATENTED

Pennsylvania Crusher Company

New York PHILADELPHIA Pittsburgh



DRYERS

AMERICAN PROCESS CO. 68 Williams Street NEW YORK CITY

ATTENTION

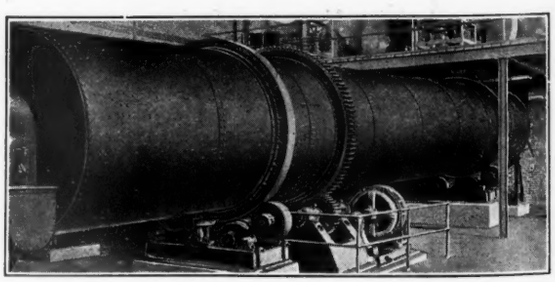
Cement Manufacturers and Supply Dealers

Cement packed in Jaite Waterproof Bags not only excludes the moisture, but also refuses to take on cement dust and dirt. Package always keeps clean.

THE JAITE CO.
JAITE, OHIO
Sole Manufacturers

Ruggles-Coles Dryers

for coal, clays, sand, stone, etc. They will burn less fuel than any other type and with their low power and repair costs are most economical to operate.

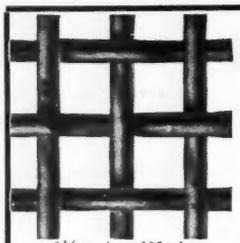


Built to Dry at the Lowest Ultimate Cost

Ruggles-Coles Engineering Co.

McCormick Building Chicago — 50 Church Street New York

WORKS: YORK, PENNSYLVANIA



2½ mesh; .105 wire

EVERY STEP

In the manufacture of

"Cleveland" Double Crimped Wire Cloth

is taken with one definite end in view

Service

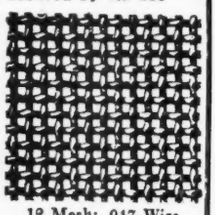
A uniform fineness is assured by its use

Unequalled for the screening of

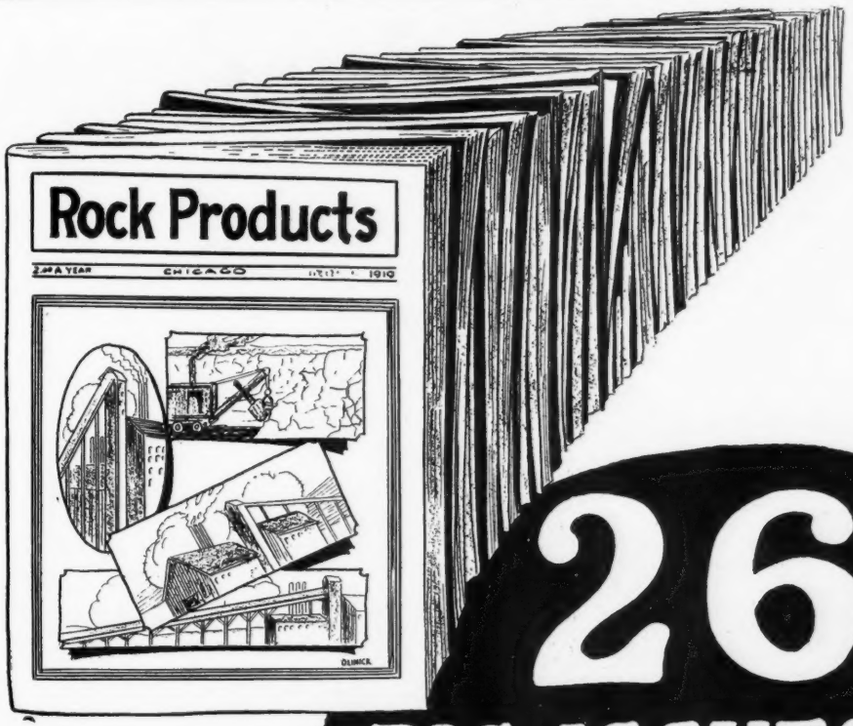
Sand, Gravel, Crushed Stone and Cement

A large stock always on hand. However, any special mesh will be manufactured to suit requirements. PRICES RIGHT.

The Cleveland Wire Cloth and Manufacturing Co.
3573 E. 78th Street, Cleveland, Ohio



12 Mesh; .047 Wire



Lots of Pictures

26 BIG ISSUES for $2

Covers

completely the interests of producers of Lime, Cement, Gypsum Products, Crushed Stone, Sand, Gravel, Agricultural Limestone, Phosphate, Potash and Glass Sand.

Rock Products

is more than the journal of your industry. It is a SERVICE—definite—authoritative—comprehensive—complete. ¶ Every two weeks it comes to you—an expensive compilation of what has happened during the past fortnight in the way of trade activity—selling, buying, legislation. ¶ And there are articles, too—about interesting quarries, pits, lime plants and so on. ¶ In every issue you will also find incorporated new ideas in the day's work—stunts that will make or save you money.

Market Prices

Not the least of ROCK PRODUCTS' service is the current market quotations. Always up to the minute and divided into localities. This feature alone should induce you to mail the coupon. Do it! Fill in and mail without delay so that you will get the next issue!

This Issue or Any Other, Substantiates the Above Review of ROCK PRODUCTS

ROCK PRODUCTS
542 So. Dearborn St., Chicago

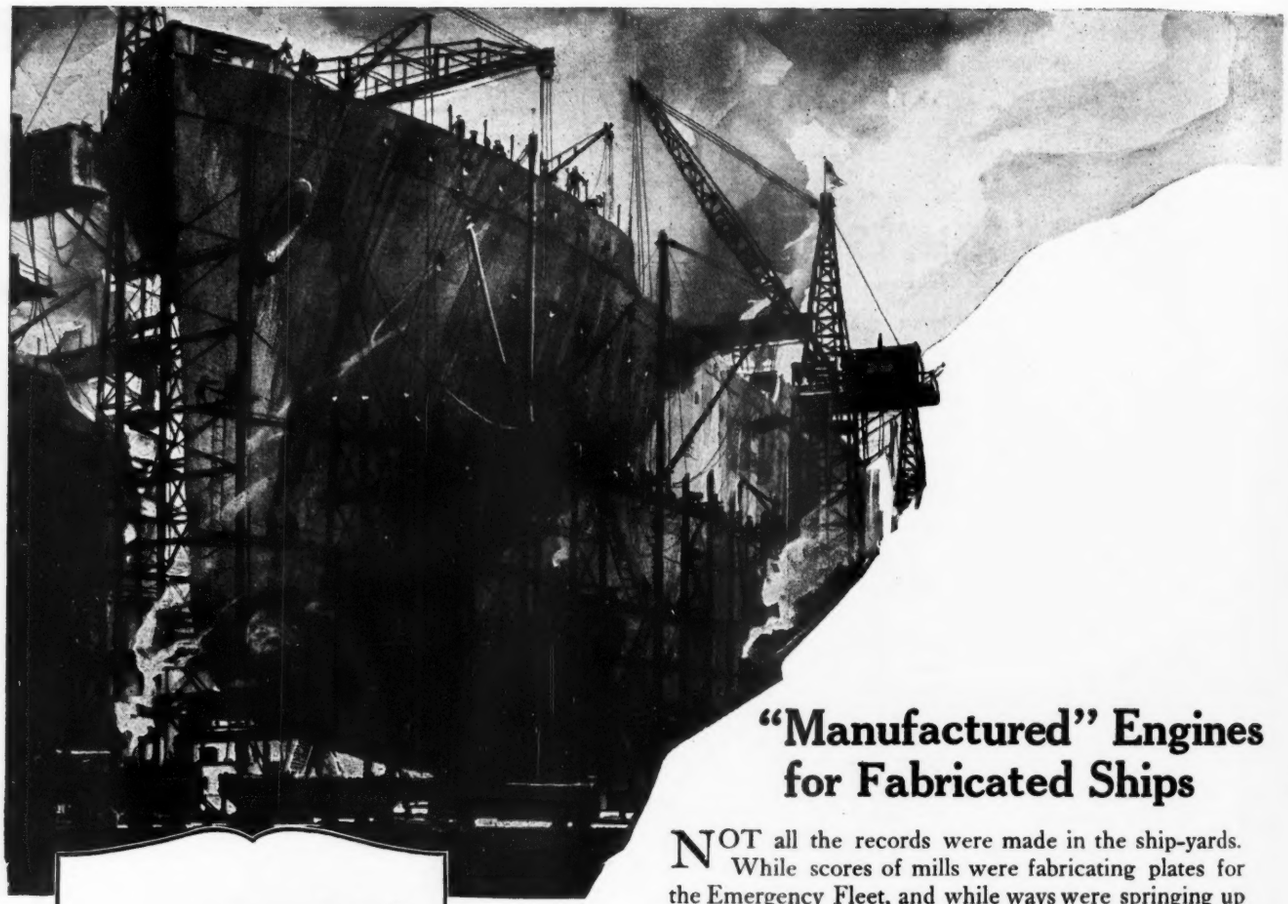
Here is my $2.00 for a full year's subscription to ROCK PRODUCTS.

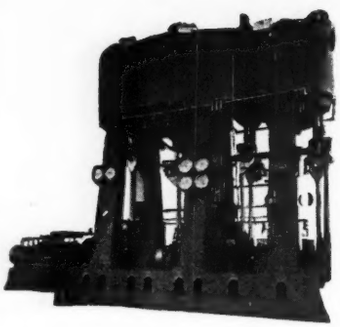
Name.....

Address.....

ROCK PRODUCTS is published every other week by Tradepress Publishing Corporation, 542 So. Dearborn St., Chicago. Subscription: $2.00 a year in the United States, $3.00 in Canada. Entered as second class matter July 2, 1907, at the postoffice in Chicago, under Act of March 3, 1879.

Saying, "I saw it in ROCK PRODUCTS," will bring quick action.





Even though each engine weighed more than seventy tons, Worthington team work was equal to twelve a month.

"Manufactured" Engines for Fabricated Ships

NOT all the records were made in the ship-yards. While scores of mills were fabricating plates for the Emergency Fleet, and while ways were springing up over night, another job, just as vital, was moving just as fast and just as surely through an organization accustomed to emergencies.

In August, 1917, an order was given to Worthington for 50 Marine Engines for the Emergency Fleet. Each engine was of 1400 horse-power, standing 20' 2" high—weighing 143,000 pounds. The first order for 50 engines was followed by subsequent contracts for 132 more—it was the largest order of its kind ever issued. On January 26th, 1918, the first engine was shipped, and thereafter three a week, twelve a month—almost automatically the big engines sprang to completion.

And these engines, like the ships, were "fabricated." Low-pressure cylinders and fittings from our Harrison Works, and intermediate cylinders and big forgings from our Power and Mining Works were rushed to Buffalo. There our Snow-Holly Works made the high-pressure cylinders, the housings and bed-plates, and so on, erected, tested, knocked down, and shipped the completed engines at a rate which had never before been dreamed of.

The American genius for organization and team work has seldom been better illustrated.

Worthington Pump and Machinery Corporation
***Executive Offices:* 115 Broadway, New York City**
Branch Offices in 24 Large Cities

PRODUCTS FOR MILL AND QUARRY
Air Compressors, Gyratory and Jaw Crushers,
Cement Making Machinery, Screens, Ball Mills
Special Bulletins on Request

PUMPS—COMPRESSORS—CONDENSERS—METERS——OIL & GAS ENGINES—MINING MACHINERY

WORTHINGTON

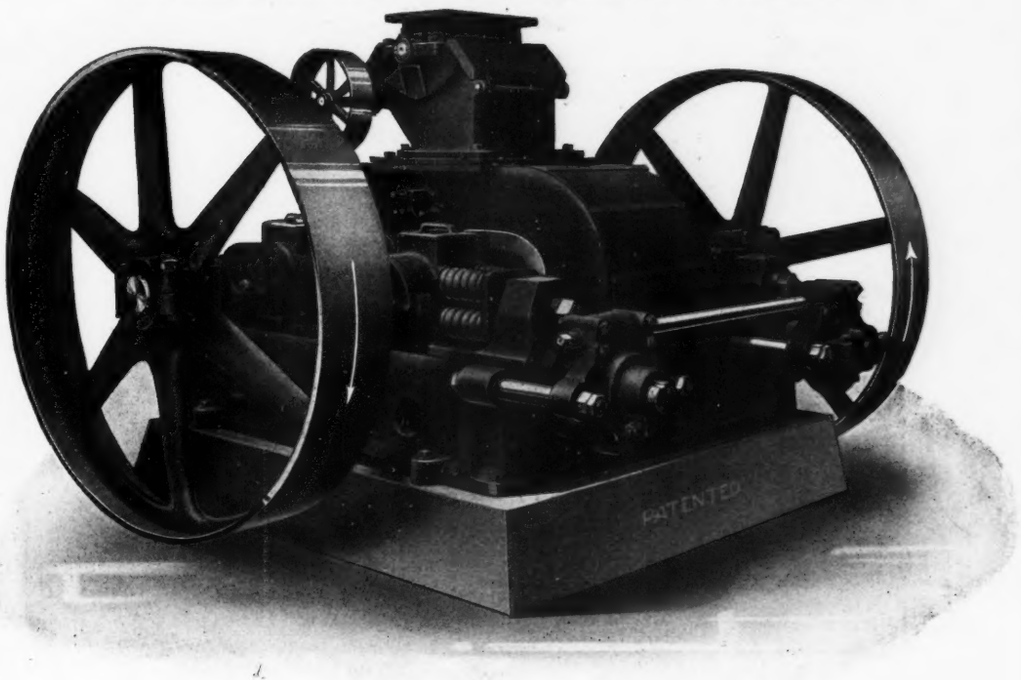
Worthington Works, Harrison, N. J.
Blake & Knowles Works, East Cambridge, Mass.
Deane Works, Holyoke, Mass.
Hazleton Works, Hazleton, Pa.
Snow-Holly Works, Buffalo, N.Y.
Laidlaw Works, Cincinnati, Ohio.
Power & Mining Works, Cudahy, Wis.
Gas Engine Works, Cudahy, Wis.

Cooperation is the thing—please mention ROCK PRODUCTS.

"ONE MAN – ONE MINUTE"

STURTEVANT "OPEN-DOOR" MACHINERY

BALANCED CRUSHING ROLLS



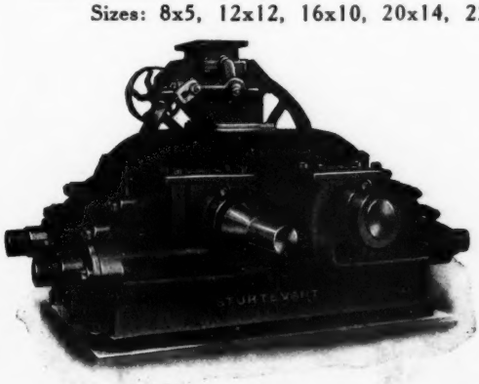
PATENTED

CRUSHING SHOCKS QUARTERED

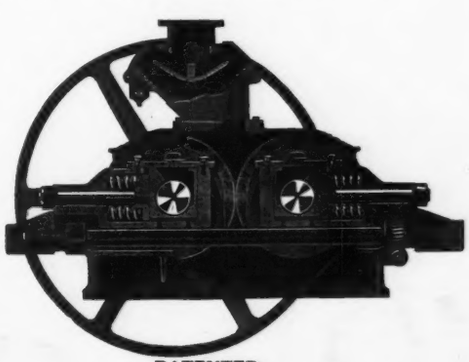
Because the springs back of **all** four bearings allow the rolls to spring back in relief, **equally** and **oppositely,** thus balancing each other and **QUARTERING** the usual crushing shocks common to such machines.

Automatic adjustments, while operating—No shims—Great, strong, massive machines, built to withstand hardest usage, such as crushing of Ores, Emery, Alundum, Corundum, and other hard abrasives.

Sizes: 8x5, 12x12, 16x10, 20x14, 22x14, 26x15, 30x16, 32x16, 36x20, 38x20.



PATENTED



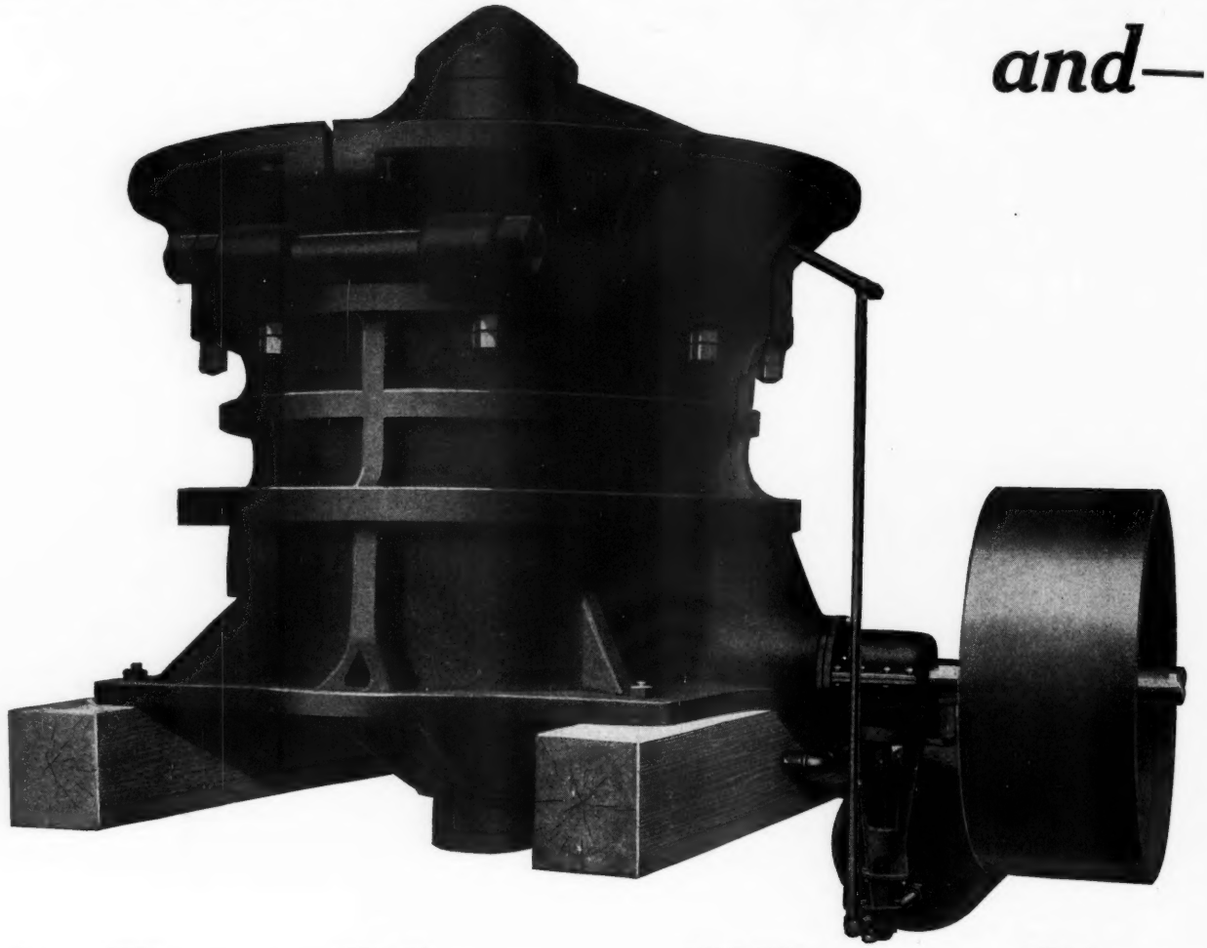
PATENTED

STURTEVANT MILL CO., BOSTON MASS.

HARRISON SQUARE

For better service say, "I saw it in ROCK PRODUCTS"

TELSMITH'S PICTURE *and—*



A Few Places Where You Can See Him At Work—

There are more than 500 Telsmith Crushers operating in the United States. Here are a few installations, widely scattered, where interested parties can see the Telsmith Pillar-Shaft Crusher in operation:

Thomasville Stone & Lime Co., Thomasville, Pa.; Charles Warner Co., Wilmington, Del.; Thomas Iron Co., Wharton, N. J.; A. H. Wilcox Co., Chicago, Ill.; St. Joseph Lead Co., Bonne Terre, Mo.; United Railways Co., St. Louis, Mo.; F. W. Woodruff, Louisville, Ky.; Casparis Stone Co., Piqua, Ohio; Liberty Bell Gold Mining Co., Telluride, Colo.; Penn Iron Mining Co., Vulcan, Mich.; United Eastern Mining Co., Oatman, Ariz.; Shattuck Arizona Copper Co., Bisbee, Ariz.; Warren Construction Co., Portland, Ore.; Nelson Storey, Bozeman, Mont.; Barnes King Development Co., Marysville, Mont.; Hilder Granite Co., St. Cloud, Minn.; Defrain Sand Co., Philadelphia, Pa.; Chagrin River Sand & Gravel Co., Cleveland, O.; Nashville Railway and Light Co., Nashville, Tenn.; Federal Lead Co., Flat River, Mo.; Elko Prince Mining Co., Midas, Nev. Glad to send you our catalog No. 166.

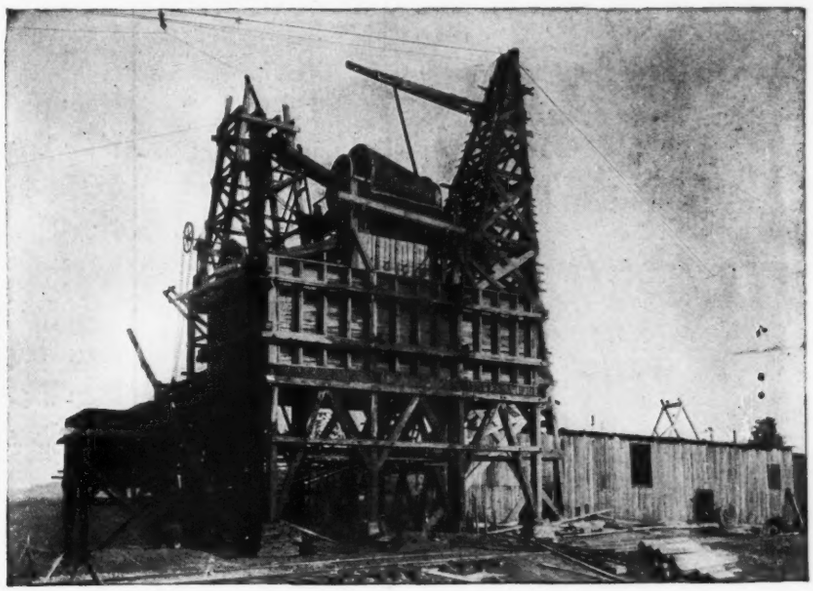
SMITH ENGINEERING WORKS

3188 Locust Street **Milwaukee, Wisconsin**

The advertiser wants to know that you saw his ad in ROCK PRODUCTS

Webster Equipped

Sand and Gravel Plants



Engineered to provide commercial economy in operation and production

This company does more than manufacture good machinery.

Our engineers render the buyer of Webster Equipment a far reaching service.

The physical conditions of each sand and gravel plant site are studied. Likewise the market conditions.

Plants are designed that will do the work required at a minimum cost and in the most effective way.

The same form of service applies to elevating and conveying machinery for cement and chemical plants.

Upon request and without obligation to you Webster Engineers will study your requirements and make recommendations.

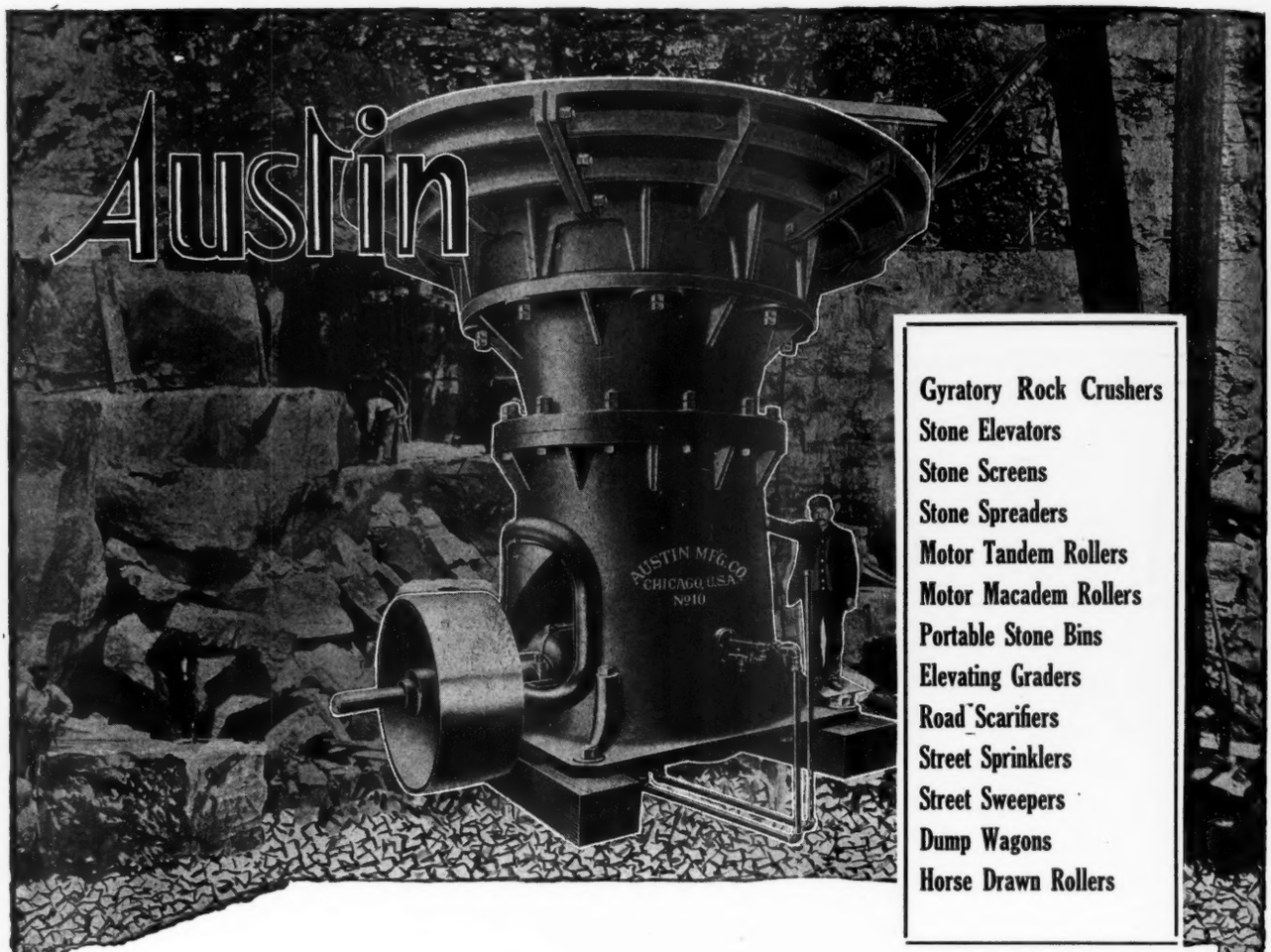
(263)

THE WEBSTER M'F'G COMPANY, TIFFIN, OHIO

New York **Boston** **Chicago**

Sand and Gravel Plant Machinery, Screens, Conveyors, Feeders, Drives, Friction Clutches, Etc, Etc.

You will get entire satisfaction if you mention ROCK PRODUCTS.



- Gyratory Rock Crushers
- Stone Elevators
- Stone Screens
- Stone Spreaders
- Motor Tandem Rollers
- Motor Macadem Rollers
- Portable Stone Bins
- Elevating Graders
- Road Scarifiers
- Street Sprinklers
- Street Sweepers
- Dump Wagons
- Horse Drawn Rollers

AUSTIN
Gyratory Rock Crushers

Reconstruction abroad means more construction at home.

More than ever before, American contractors, builders and quarry-operators are in need of rock-crushing and rock-handling equipment that can be depended upon to deliver larger outputs and that will work steadily and efficiently without interruptions and breakdowns.

Austin Gyratory Crushers—ranging in capacity from 50 to 5,000 tons per day—are guaranteed to render continuous service under the most severe operating conditions. Their convenient adjustment means an easy, speedy change in the size of the product; their large output cuts down tonnage costs because they work steadily over a wide range of material.

Write today for catalog, describing and illustrating **Austin** Crushers, Elevators, Hoists, Cars, Screens, Bins, Stone Spreading Wagons and all types of Road Building and Maintenance Equipment.

Our engineering experts will be glad to help you solve your problems and advise you as to the machinery best suited to your needs.

During the War the United States and Allied Governments purchased
Over 700 Austin Motor Rollers
More than ten times their combined purchases of all other rollers.
And at Higher Prices. **WHY?**

Austin Manufacturing Co.
CHICAGO
New York **San Francisco**

Prompt attention will be given your inquiry if you mention ROCK PRODUCTS

Home from the War—Back on the Job!

The Marion Steam Shovel Company is again at your service. The manufacturing organization on *this* side of the water, and dozens of "Marion" Shovels "over there," gladly did their bit when needed most.

Now we are swinging back to normal production—ready to help America's engineers, contractors and manufacturers make up for lost time.

Write us fully about your work—we'll gladly help you pick the right equipment for the job ahead of you.

The above photograph was taken on French soil. Though the shovel itself was pretty well camouflaged by enthusiastic Yanks and Poilu, the picture tells a lively story of co-operation, energy and results. We have plenty of evidence that this "Marion" and the dozens of other "Marions" that served in France during the war, did a brave job and carried through to the last tap.

THE MARION STEAM SHOVEL COMPANY

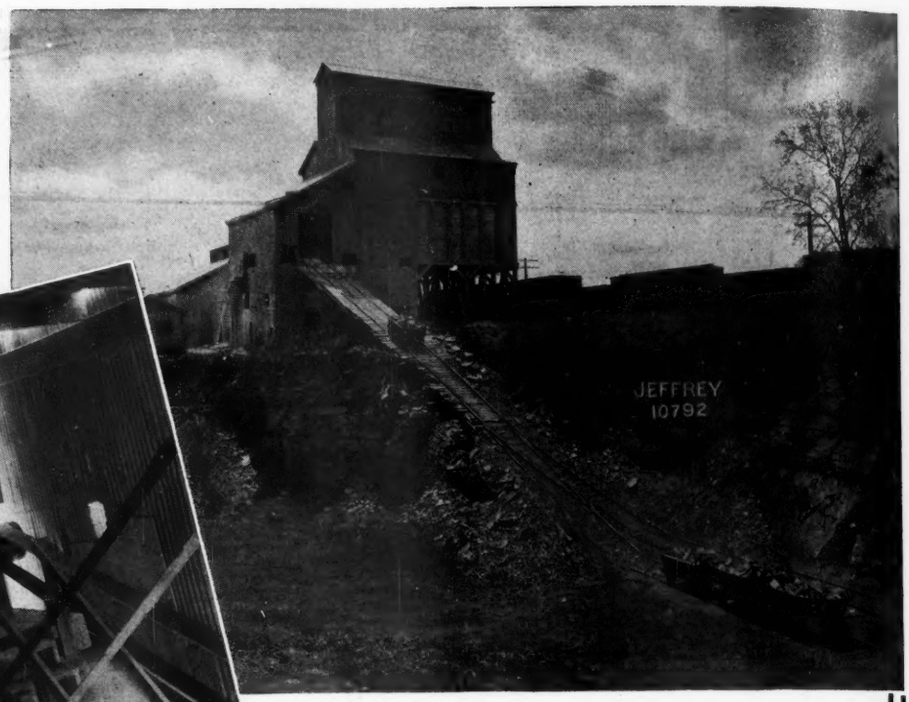
Established 1885 **Marion, Ohio**

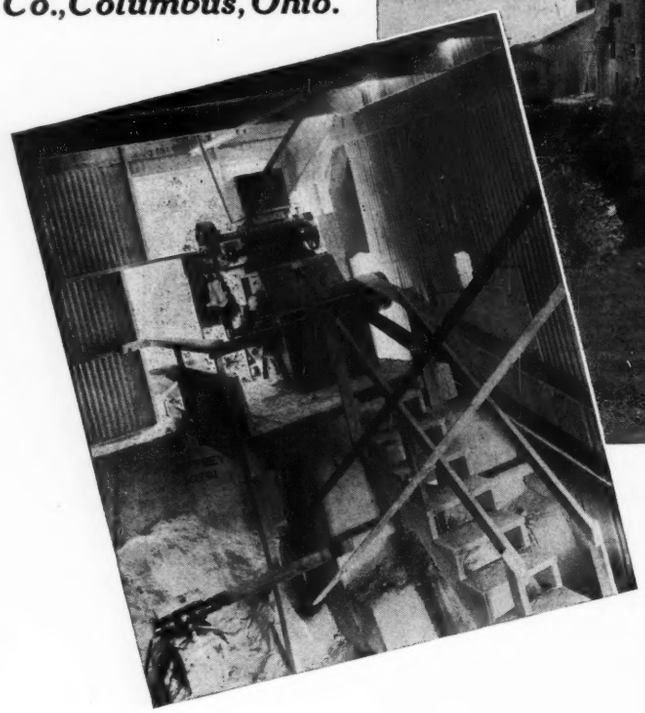
CHICAGO NEW YORK SAN FRANCISCO

Marion

To say you saw the ad in ROCK PRODUCTS gives tone to your inquiry

Jeffrey Type "D" Pulverizer in operation at the Colgan Limestone Products Co., Columbus, Ohio.





A Pulverizer Especially Adapted for Making Agricultural Limestone

Leading Quarry operators are installing

Jeffrey Type "D"
Ball Bearing Pulverizers

for increasing their plant capacities to meet the constantly increasing demand for ground limestone.

Write for Pulverizer Catalog No. 147-D

The Jeffrey Mfg. Co. 935 North Fourth St. **Columbus, Ohio**

Manufacturers of Pulverizing, Conveying and Elevating Machinery; Chains; Self-Propelling Loaders; Electric Trolley and Storage Battery Locomotives, etc.

It gets immediate attention if you mention ROCK PRODUCTS

GRASSELLI EXPLOSIVES

A strong market for Rock Products is assured. $574,000,000 is available for road-building in the next three years. The Railroad Administration has set aside $11,500,000 for ballasting in 1919. The breakdown of existing roads under war-time truck traffic has demonstrated that highways too must have heavier ballast.

Increased output and more economical production will make profits certain. Let the quality explosives of the Grasselli Powder Company offset high wages. Let our field service decrease operating expenses.

In addition to explosives of the highest efficiency, we offer the assistance of our corps of experts, trained by years of practical experience in the solution of difficult blasting problems.

For information regarding "Grasselli" service address

The Grasselli Powder Company

Cleveland, Ohio

For better service say, "I saw it in ROCK PRODUCTS"

WILLIAMSPORT WIRE ROPE

Is a tried and proven product, known for more than thirty years as of the highest quality. We offer you *Williamsport Quality Rope* and *Bourne Fuller Service*, which means—

In Cleveland—

The most complete stock of Rope in this section—all sizes, all constructions.

In Cincinnati—

All ropes suitable to the industries of the section—haulage, transmission, hoisting ropes, elevator cables, etc.

In Williamsport—

The most modern Wire Rope Factory in America—a self contained unit, drawing its own wire and producing Ropes which are guaranteed to be equal, if not superior, to any rope on the market.

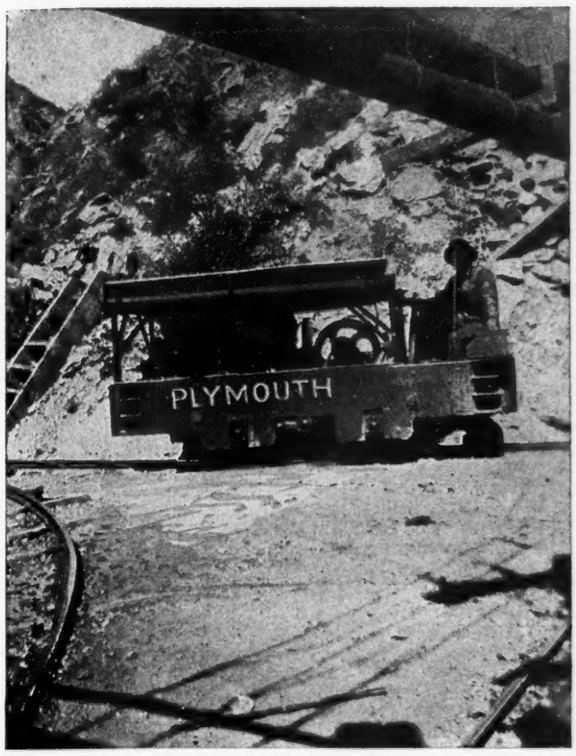
OUR IMPROVED PLOW STEEL ROPES ARE THE STRONGEST AND MOST EFFICIENT ROPES PRODUCED

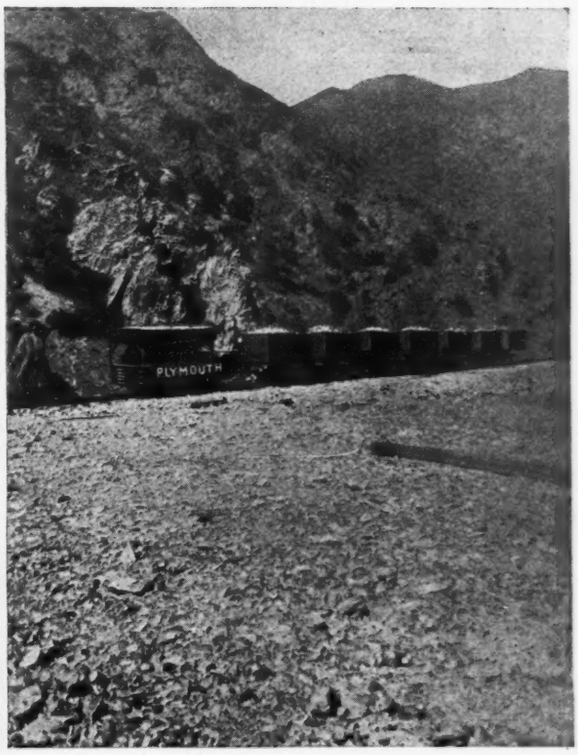
The Bourne-Fuller Co.

Wire Rope Iron Steel Pig Iron Coke

CLEVELAND

Pittsburgh Cincinnati
Detroit Chicago New York

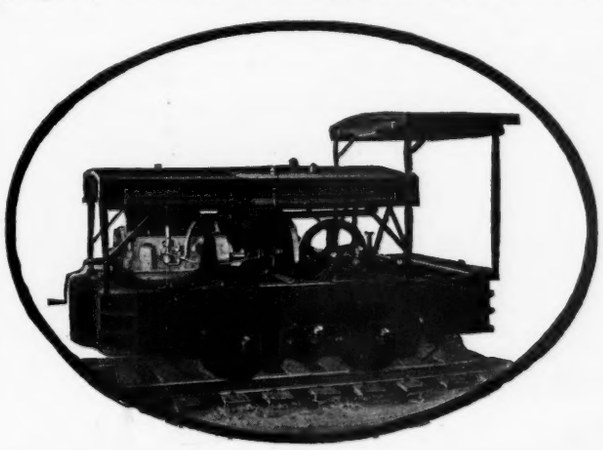




PLYMOUTH
Gasoline Locomotives

BOTH underground and open-air haulage are involved in the Southern California Edison Co.'s tunnel excavation work at Inyokern, Calif. A standard "Plymouth" Gasoline Locomotive is hauling the muck.

The operation is part of a hydro-electric project, and the Locomotive travels underground for about a mile, handling four-car trains against a grade running two feet per 1000. Each car holds about 40 feet. This "Plymouth" is operated steadily through one shift per day and is giving entire satisfaction.



Whatever *your* material and wherever your tracks lead—whether underground, on the surface or up overhead—"Plymouth" Gasoline Locomotives will help put your haulage on a steady, reliable, efficient basis.

You will be interested in "Plymouth" Books—they show just what "Plymouth" Locomotives are doing for other firms. We shall be glad to send them if you will write us fully about your own work.

THE J. D. FATE COMPANY
210 Riggs Avenue, PLYMOUTH, OHIO

New York Philadelphia Norfolk Pittsburgh
Cleveland Detroit Chicago St. Louis
Kansas City Minneapolis Portland

The advertiser wants to know that you saw his ad in ROCK PRODUCTS

Proof

SIZE of crusher: 48 inches. Material crushed: limestone. Length of time operated: three years. Size of feed: 4 inches. Size of product: 1 1-2 inches. Horsepower used: 65. Tons crushed per hour: 80 to 100. Tons crushed per set of discs: 750,000. Time lost on account of breakage: none.

Size of crusher: 24 inches. Material crushed: gravel and hard heads. Length of time operated: 2 years. Size of feed: 2 inches. Size of product: 1-2 inch. Horsepower used: 20. Tons crushed per hour: 25. Original crushing discs still in use. Time lost on account of breakage: none.

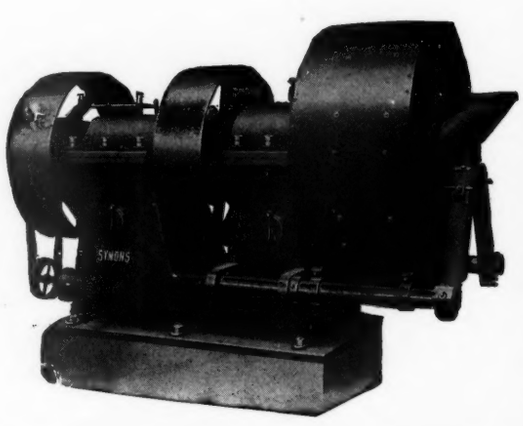
SYMONS
DISC CRUSHERS

earned the above records. Names of quarries will be sent upon request.

Symons Crushers are primarily designed for secondary crushing, but where the feed is not larger than 6 inches, the 48-inch size performs with true Symons success as an initial breaker.

The margin of strength in the secondary crusher that makes it successful in first-stage work is your insurance of super-strength.

We will be pleased to help you satisfactorily solve your crushing problems.



CHALMERS & WILLIAMS
1425 Arnold St. Chicago Heights, Ill.

You will get entire satisfaction if you mention ROCK PRODUCTS

Rock Products

TRADEPRESS PUBLISHING CORPORATION
542 SOUTH DEARBORN STREET
CHICAGO

NATHAN C. ROCKWOOD
Editor

T. BIRCHLER
Assistant Editor

GEORGE P. MILLER
Manager

C. N. PAUGH
Eastern Representative

SUBSCRIPTION

$2 a year in United States; $3 a year, Canada and foreign. Single copies, 20 cents. Date on wrappers indicates issue with which your subscription expires. In writing to have address changed, give old as well as new address.

Entered as second class matter July 2, 1907, at the Postoffice at Chicago, under act of March 3, 1879.

PUBLISHED EVERY OTHER SATURDAY by the Tradepress Publishing Corporation, 542 South Dearborn St., Chicago, Ill., U. S. A. W. D. Callender, president; T. J. Sullivan, vice-president; George P. Miller, Treasurer; A. Perrin, Secretary.

Vol. XXII, No. 11 May 24, 1919

Printing of this issue, 4,000 copies

Second class entry at U. S. Post Office.

Table of Contents

Editorial—Price of Labor Needs Stabilizing 15
Sixteen Years' Growth of the Quarry Industries 16
Pointers to Quarrymen on Accident Prevention 17
Crushed Stone as a By-Product of Georgia Granite Block Production 18–21
Hints and Helps for the Plant Superintendent 22–23
Washed Sand and Gravel for Road Construction 24
American Silica Sand Association Meeting 25
Illinois Sand & Gravel Producers' Association and Officers 26
Silica Rock Industry Holds Nearly All Pre-War Gains 27–28
Use of Phosphate and Limestone in Illinois Agriculture 29
How the Fertilizer Interests Attack the Illinois System of Agriculture 30
Review of the Phosphate Rock Market 31
Screening Practice in the Industries 32–33
Domestic Production of Potash in 1918 33
Canadian Magnesite Industry 34–35
Why Houston Opposes Federal Highway Commission 36
Special State Highway Committee to Advise in Federal-Aid Work 36
Effect of Cement Dust on Workers Investigated by United States 37
New Machinery 38
General News from the Rock Products Markets 39
Prices Show Upward Tendency: Prices Will Not Drop 40
Awarding of Road Contracts in Illinois Continue 41
Wholesale Prices of Crushed Stone and Agricultural Limestone 42
Wholesale Prices of Sand and Gravel, Glass and Foundry Sand 43
General News from the Rock Products Markets 44
Passed by the Screens 45

ALPHABETICAL LIST OF ADVERTISERS

Aero Pulverizer Co. 49
Aetna Explosives Co. ..... Inside back cover
Allis-Chalmers Mfg. Co. 58
American Process Co. ..... Inside front cover
American Steel & Wire Co. 49
Atlas Car & Mfg. Co. 54
Audubon Wire Cloth Co. 61
Austin Mfg. Co. 6

Bacon, Earle C., Inc. 51
Ball Engine Co. 55
Bates Valve Bag Co. 63
Beaumont Mfg. Co. 53
Bourne-Fuller Co. 10
Bradley Pulverizer Co. 62
Browning Co., The 51
Buckbee, J. C. 54
Butterworth & Lowe 55
Byers Machine Co., John F. 51

Chalmers & Williams 12
Chicago Perforating Co. 51
Classified Advertising 47
Cleveland Wire Cloth Co. ..... Inside front cover
Cross Eng. Co. 53

Dunning & Boschert 51

Ehrsam & Sons Co., J. B. 49
Ensign-Bickford Co. 63
Erie Steam Shovel Co. 55

Fate Co., J. D. 11
Fuller Engineering Co. 49
Fuller-Lehigh Co. 52

Gifford-Wood Co. 52
Good Roads Mach. Co. 64
Grasselli Powder Co. 9
Gruendler Pat. Crusher & Pulv. Co. 49

Hendrick Mfg. Co. 64
Huron & Wyandotte Portland Cement Co. 47

Jaite Co., The ..... Inside front cover
Jeffrey Mfg. Co., The 8
Johnston & Chapman 52

K-B Pulverizer Co., Inc. 53
Kennedy-Van Saun Mfg. & Eng. Co. 57
Kent Mill Co. 61

Leschen & Sons Rope Co., A. ..... Inside back cover
Lewistown Fdy. & Mach. Co. 50
Lima Locomotive Works 59
Link-Belt Co. ..... Back cover
Loomis Mach. Co. 57

Marion Steam Shovel Co. 7
Mayer-Hasseldiek Mfg. Co. 51
McLanahan-Stone Machine Co. 49
McMyler Interstate Co. 56
Miscampbell, H. 53

National Engineering Co. 56
Nortmann-Duffke Foundry Co. 50

Ohio Locomotive Crane Co. 50
Osgood Co., The 51
Owen Bucket Co. 50

Pennsylvania Crusher Co. ..... Inside front cover
Phoenix Wire Works 50

Raymond Bros. Impact Pulv. Co. 60
Robins Conveying Belt Co. 50
Robinson Clay Product Co. 48
Ruggles Coles Eng. Co. ..... Inside front cover

Sanderson Cyclone Drill Co. 54
Sauerman Bros. 50
Schaffer Eng. & Equip. Co. 59
Smidth, F. L., & Co. 50
Smith Eng. Works 4
Steacy-Schmidt Mfg. Co. ..... Inside front cover
Stephens-Adamson Mfg. Co. 58
Sturtevant Mill Co. 3
Sullivan Machy. Co. 56

Teepfer & Sons Co., W. 49
Track Equipment Co. 57
Traylor Eng. & Mfg. Co. ..... Front cover

Universal Crusher Co. 54
Universal Road Mach. Co. 55
Used Equipment 46

Vulcan Iron Works ..... Inside back cover

Watt Mining Car Wheel Co. 56
Webb City & Carterville Foundry & Mach. Works 52
Webster Mfg. Co. 5
Weller Mfg. Co. 60
White Co. 14
Williams, C. K., & Co. 47
Williams Patent Crusher Co. 55
Woodville Lime Products Co. 48
Worthington Pump & Mach. Co. 2

Yates, Preston K. 49

A New Low Cost
of
HEAVY HAULAGE

THE new White heavy duty trucks have been designed with but one end in view: to do more work at lower cost. They carry forward the White policy of building trucks to do the most work with the least effort.

For years the chain-driven White has set the pace in heavy haulage. It has held its own against a field of competition based on new axle features. It has won its place by sheer merit *as a truck*, and not because of any single feature in it. It is standard today in America's greatest fleets.

In White Trucks, mechanical changes are made only to improve operation. The company has always sold operating efficiency—*truck performance.*

The heavy duty models remained chain-driven until we were able to develop an enclosed form of drive having all the advantages of chain and sprocket. This has now been done. The Double Reduction Gear Drive is the full counterpart of chains in *applying* power. It has the chain *pull*, in *gear* form.

The new trucks follow a twofold aim in White design: sturdy engine up in front and maximum pull in the rear. The final drive saves power and therefore fuel. The lubrication saves oil. Light unsprung weight saves tires. Continuous operation saves time of both truck and driver by a steady volume of performance.

In all its years of transportation service, The White Company has never swerved from its original purpose to build an *economical* truck.

These new trucks are money *savers.*

THE WHITE COMPANY
Cleveland

WHITE TRUCKS

Prompt attention will be given your inquiry if you mention ROCK PRODUCTS

Rock Products

Vol. XXII Chicago, May 24, 1919 No. 11

Price Which Needs the Most Stabilizing Is the Price of Labor

Producers Make Concessions in Prices of Material While Labor Demands More and More

IN SPITE OF THE MOST OPTIMISTIC kind of propaganda issued by one division of the Department of Labor at Washington regarding the great increase in building activity, another division of the same department admits in much less ostentatious manner that unemployment is constantly on the increase. The statistics of unemployment are real. The building activity propaganda is in general based on reports of building permits issued and means nothing at all except that there exists a genuine desire to build.

What is holding up all this prospective construction work? What is the nature of this brake on the wheels of the building industry? Is it really the so-called high prices of construction materials? Is it the failure of the government attempt to stabilize the prices of materials? Is it the failure of government propaganda to encourage building?

All these things may have something to do with the situation, but keen business men who during the war were temporarily connected with the Department of Labor at Washington seem to believe that we are harvesting the results of our war labor policy, or rather the want of a labor policy.

Many of these ex-dollar-a-day men acknowledge publicly their respect and admiration for the masterly manner in which the labor leaders have conducted their side of the controversy; and they predicted, even during the war, that the public would suffer sooner or later for the want of equally able leaders to represent it and the government.

During the war there was no established scheme of handling labor problems. Each government department handled its own problems in its own way. Each department competed with all other departments, and wages in the war industries were sent sky high. No one can predict how high they would have continued, for the only general principle that all the departments recognized was to concede everything asked or demanded by labor.

These were war times. Things had to be done. It was the government's money anyhow and there was lots of it.

Laborers as well as operators in the building and construction industries suffered, while their brethren in the munition industries waxed rich. Naturally these building construction laborers felt that when their time came they would make up for lost time.

But conditions have changed; war work had to be done; construction work may wait. Government stabilizing of material prices might have helped to settle conditions, but if it had done so it would only have been because in fixing these prices they were indirectly fixing the price of labor. In plain words they were intentionally or unintentionally tackling the real problem back end first.

If this notorious failure of the government to stabilize business conditions ends by tackling the real problem logically—by bringing about an understanding between employers and employees as to a fair and stable wage schedule—then every business man can rejoice over the ignominious end of the Industrial Board of the Department of Commerce. Whatever the immediate prospect of a national labor policy

Preparing Program For the Annual Lime Meeting

THE PROGRAM for the annual meeting of the Lime Association to be held June 18-19 at the Wm. Penn hotel, Pittsburgh, Pa., is in the making.

The possibilities for improvement of trade conditions, for development of the demand for lime and for closer mutual understanding and cooperation will form important parts of the program. Among subjects to be presented by experts is "Compensation Insurance." The use of steel barrels instead of wooden ones will be discussed. Other matters no less vital will be brought up.

General Manager Robert F. Hall reports that a substantial number of hotel reservations have been made and suggests that others should send in their reservations at once.

may be, nearly every business man today is beginning to recognize that the only unstable element in the present situation is the laboring man, yet he is the one who will suffer most if unstable conditions continue. Under such conditions it would seem that the national Department of Labor might have a more useful function to perform than loading the mails with optimistic propaganda, the only tangible result of which has been to encourage the construction laborers to believe that they held the situation by the same grip that the munition laborers held it during the war.

This probably accounts for the fact that in nearly every instance where building material producers have cut prices with some success in having things started, the net result has been strikes and exorbitant demands on the part of the building trades unions. It is not surprising under these conditions that construction work lags even in spite of a really keen desire to build.

Bulletins on Lime Uses Forthcoming This Year

IT IS BECOMING increasingly evident that promotional work for chemical lime by means of the distribution of bulletins bearing upon the various uses for chemical lime will be essential during the coming year's activities, says the Weekly letter of the Lime Association. In January the chemical bureau sent to all the members a list showing the industries using chemical lime. There are something like 112 industries indicated on that list. Manifestly, it will be impossible to cover all these subjects with bulletins during the coming year, and it would be inadvisable to attempt any such program.

The director of the chemical bureau believes, however, that the following subjects should be given immediate attention, and that bulletins should be prepared relating to them:

Leather
Glass Manufacturing
Bleaching Powder
Rag Process Pulp
Soda Process for Paper
Sulphate Process for Paper
Sulphite Process for Paper
Cold Water Paints
Varnish
Rubber Manufacture
Lubricating Grease
Sanitation
Sewage and Garbage Purification
Water Purification

For the purpose of learning the views of all producers, it is requested that each look over the list which was sent to him in January, and point out his individual ideas as to which particular subjects should be given immediate attention. Replies should be addressed to A. D. Whipple, chief engineer. In addition, each is requested to send in any data, information, or references which he may have at hand that will be useful in preparing bulletins on these various subjects.

A. P. Sandles, Secretary National Crushed Stone Association Says:

THE CRUSHED STONE INDUSTRY is big enough in capital invested, in payroll, in its army of wage earners, to demand a group representation in the Chamber of Commerce of the United States. Every leading crushed stone operator should recognize this fact and govern himself accordingly, and greater prestige and recognition would be given to our industry.

Sixteen Years' Growth of The Quarry Industries

THE ACCOMPANYING TABLE compiled by Albert H. Fay of the Bureau of Mines, Department of the Interior, shows the wonderful growth of the rock products industries since the time ROCK PRODUCTS was founded in the early nineties.

The "Limestone Industries"—cement, lime and limestone (cut stone, crushed stone, blast furnace flux, agricultural limestone, etc.)—constitute over 80 per cent of all the rock products in value of output.

Deducting $30,000,000 for the value of all cut stone or dimension stone and the remaining value of the 1917 quarry production is over $200,000,000, all of which wealth originates entirely in crushed stone quarries. These figures of course do not include sand and gravel, foundry sand, phosphate rock and some others.

Year.	Limestone.	Lime.	Granite.	Trap rock.	Portland cement.	All other cement.[b]	Marble.	Sandstone.	Slate.	Bluestone.	Miscellaneous.	Total.
1891	[c] $15,792,000	(d)	$13,867,000	.....	$967,429	$5,704,008	$3,610,000	$8,700,000	$3,825,746	[a] $1,500,000	.....	$53,966,183
1892	[c] 18,342,000	(d)	12,642,000	.....	1,153,600	5,999,150	3,705,000	8,315,500	4,117,125	[a] 1,600,000	.....	55,874,375
1893	[c] 15,947,222	(d)	8,808,934	.....	1,158,138	3,251,757	2,411,092	5,295,151	2,523,173	[a] 1,000,000	.....	38,395,467
1894	[c] 16,190,118	(d)	10,029,156	.....	1,383,473	3,635,731	3,199,585	3,935,847	2,790,324	[a] 900,000	.....	42,084,234
1895	9,974,222	$6,588,822	8,894,328	.....	1,586,830	3,895,424	2,825,719	4,211,314	2,698,700	[a] 750,000	.....	41,425,359
1896	8,387,900	6,327,900	7,944,994	.....	2,424,011	4,049,202	2,859,136	4,023,199	2,746,205	[a] 750,000	.....	39,512,547
1897	9,135,567	6,390,487	8,905,075	.....	4,315,891	3,862,392	3,870,584	4,065,445	3,524,614	[a] 900,000	.....	44,970,055
1898	9,956,417	6,886,549	9,324,406	.....	5,970,773	3,888,723	3,629,940	4,724,412	3,723,540	[a] 1,000,000	.....	49,104,765
1899	13,889,302	6,983,067	10,343,298	$1,275,041	8,074,371	4,814,771	4,011,681	4,924,670	3,962,733	815,284	.....	59,094,218
1900	13,556,523	6,797,496	10,969,417	1,706,200	9,280,525	3,728,848	4,267,253	5,272,865	4,240,466	1,198,519	.....	61,018,112
1901	18,202,843	8,204,054	14,266,104	1,710,857	12,532,360	3,254,429	4,965,699	6,974,199	4,787,525	1,164,481	.....	76,062,551
1902	20,895,385	9,335,618	16,083,475	2,181,157	20,864,078	4,502,302	5,044,182	9,430,958	5,696,051	1,163,525	.....	95,196,731
1903	22,372,109	9,255,882	15,703,793	2,732,294	27,713,319	4,228,022	5,362,686	9,482,802	6,256,885	1,779,457	.....	104,887,249
1904	22,178,964	9,951,486	17,191,479	2,823,546	23,355,119	2,676,801	6,297,835	8,482,162	5,617,195	1,791,729	.....	100,366,286
1905	26,025,210	10,941,680	17,563,139	3,074,554	33,245,867	2,685,676	7,129,071	8,075,149	5,496,207	1,931,625	.....	116,168,178
1906	27,327,142	12,480,653	18,562,806	3,736,571	52,466,188	2,836,091	7,582,938	7,147,439	5,668,346	2,021,898	.....	139,830,070
1907	31,737,631	12,656,705	18,064,708	4,594,103	53,992,551	1,911,300	7,837,685	6,753,762	6,019,220	2,117,916	.....	145,685,581
1908	27,682,002	11,091,186	18,420,080	4,282,406	43,547,679	929,977	7,733,920	5,831,231	6,316,817	1,762,860	.....	127,598,158
1909	32,070,401	13,846,072	19,581,597	5,133,842	52,858,354	772,209	8,548,905	6,564,052	5,441,418	1,446,402	.....	144,263,252
1910	34,663,678	14,088,039	20,541,967	6,452,141	68,205,800	546,292	6,992,779	6,394,832	6,236,759	1,535,187	.....	165,597,474
1911	33,897,612	13,689,054	21,194,228	6,739,141	66,248,817	456,319	7,546,718	5,854,395	5,728,019	1,876,473	.....	163,230,776
1912	36,729,800	13,970,114	19,223,302	7,560,049	67,016,928	444,585	7,786,458	5,387,848	6,043,318	1,505,763	.....	165,668,165
1913	38,745,429	14,648,362	20,793,800	9,289,809	[b] 89,106,975	443,552	7,870,890	5,752,205	6,175,476	1,280,862	.....	194,107,380
1914	33,894,155	13,268,938	20,028,919	7,865,998	[b] 80,118,475	414,728	8,121,412	[b] 7,501,808	5,706,787	(e)	.....	176,921,220
1915	35,229,866	14,424,036	17,864,439	8,489,222	[b] 74,756,674	398,428	6,916,025	[b] 6,095,800	4,958,915	(e)	.....	169,133,405
1916	41,309,599	18,509,305	17,456,838	7,666,297	[d] 104,258,216	430,874	7,033,171	[b] 5,603,778	5,338,837	(e)	.....	207,606,915
1917	46,263,379	23,897,877	15,544,957	7,570,685	[b] 122,775,088	435,370	6,330,387	5,512,421	5,749,966	(e)	$993,642	234,983,972

[a] Compiled from Mineral Resources of the United States, U. S. Geological Survey. [a] Estimated. [b] Includes bluestone. [e] Included in sandstone.
[b] Value of shipments.
[c] Includes limestone used for manufacture of lime.
[d] Included in limestone.

Industrial Commission Gives Quarrymen Pointers on Accident Prevention

Ohio State Insurance Experts Emphasize Cooperative Feature in the Efficient Handling of Labor

INDUSTRIAL ACCIDENTS were classified by T. P. Kearns, chief deputy of the Department of Inspection of the Industrial Commission of Ohio, at the conference with quarrymen Apil 17 and 18 in Columbus as "mechanical" and "psychological." Mechanical accidents are those due to the conditions existing at the plant; exposed machinery, unguarded places of hazards, lack of safety appliances. The psychological accidents are due to lack of instructions, lack of knowledge of safe practices, lack of discipline and physical defects of the workmen.

"While the Inspection Department may be able to suggest and enforce the installation of safety appliances," said Mr. Kearns, "it certainly cannot control nor enforce discipline; that is a matter that lies with the management of the plant who is always on the ground. We have in the department only enough men to visit each plant once or twice a year. It is up to the management to assign its help where fitted, to promote carefulness and to insist on the practice of safety rules.

Partakes of Welfare Work

"It is manifest that a workman with worries has not his mind on his work; he may have troubles at home. Therefore the department believes each foreman should be encouraged to associate with and become friendly with his men that he may keep in touch with their personal affairs to some extent and suggest to the employer in cases of necesity the kind of help needed. Lifting of an employee's worries in this manner may prevent an accident.

"The records show that many accidents in quarries are due to the operation of quarry cars, to explosives, to falling rock, and in plants to defective hand tools, unguarded machinery, belts, exposed shafting ends and set screws and to uncovered gears."

The Man to Be Fired

In every plant there ought to be, according to Mr. Kearns, a General Safety Committee made up of officers of the company and a Safety Manager. A good safety manager will pay his own salary in savings, he asserted.

In every well organized plant workmen should be encouraged to offer suggestions; they should known the dangerous places. Education is needed also. Many workmen actually are ignorant of the hazards they work under.

Insist on the enforcement of the rules. Insist on the compliance to the rules strictly. "Fire the man who fails to replace safeguards," urged Mr. Kearns. Men who place other men's lives in jeopardy should not be retained.

"Accident prevention is more than a business proposition, more than a moral and legal proposition; it is humanitarian as well," said Mr. Kearns. "Employer and employee all need education, manager, superintendent, foremen and men. Organize your plant.

Cooperation Preferred

"There are two ways the department can obtain results, byt the big stick, enforcing the laws strictly, or by co-operation. The later method is preferred by the department; it is much more pleasant for all."

"The installation of safety appliances is not all there is to this question," said Thomas J. Duffy, chairman of the commission, "just as important is the establishment and enforcement of rules of safeyt, instruction and discipline. You may have mechanical safeguards, but lacking the safe practices at points where it isn't the question of appliances. the accidents may be numerous. In fixing a rate we cannot allow a reduction on the suposition that safe practices are being followed."

Investigations Impress Superintendents

At the request of Mr. Kearns. D. C. Souder of the France Stone Co. told something of what his company is doing in the interest of safety. He said:

"The installation of safeguards has been our chief concern at all our plants. Whenever an accident occurs we investigate thoroughly and plan to do something to prevent a repetition. The superintendents, if indifferent in the beginning, become impressed by our persistent investigations, and are thus brought to a realization of the great importance of the matter.

"You cannot inspect a plant too often. The first week we visit a plant. we make recommendations. The following week we inspect again to see what has been done. We work the best we can with the superintendent and try to get him interested and in time generally succeed and get his earnest interest. If not, we go to the management."

Attention was directed to the fact that foremen while insisting on their men obeying safety rules will do exactly what they prohibit their men from doing. Several instances were cited; one in which the foremen after compelling some men to leave a track on which were moving quarry cars, deliberately walked up the track himself and was struck.

The matter of goggles brought out the fact that the men seemed disinclined to wear them. This gives considerable trouble to safety committees who are constantly on the alert for this violation. Many accidents to the eyes occur where goggles are provided, because the men carelessly leave them off, and seem stubborn to the rule. Mr. Souder said he keeps after the men constantly.

The meeting resulted in two confessions, if they may be so called. Mr. Patterson of the Bluffton-Lewisburg Stone Co., Bluffton. O., said:

"We have adopted plans and appliances as we saw the need of them and thought we had done about all we could do, but since hearing these talks, I can see many more places that need safe guards."

Dan Evans of the John Evans Limestone Co., Marion, O., added: "I am like Patterson. Since I have been sitting here, I can see two places unguarded at our plant."

Liability in Blasting Injuries

FAILURE TO FURNISH REASONABLY good fuses for blasting work may be found to be actionable negligence, making quarry owners liable for resulting injuries sustained by employes, according to a recent decision of the Supreme Court of South Dakota.

Judicial interpretation of the point involved may, of course, vary in different states, but the attitude of the courts generally seems to favor the view that industry must pay for its casualties, without reference to any question of negligence.

Safety for both employer and employe, in blasting, lies in using reliable explosives, of known merit and characteristics, and equally dependable fuses, caps and other supplies.

Crushed Stone as a By-Product of Georgia Granite Block Making

Unique Methods of Quarrying Produce Paving Blocks Easily, but Crushed Stone Is Hard to Make—At the Same Time the Easiest and the Most Difficult Stone to Work

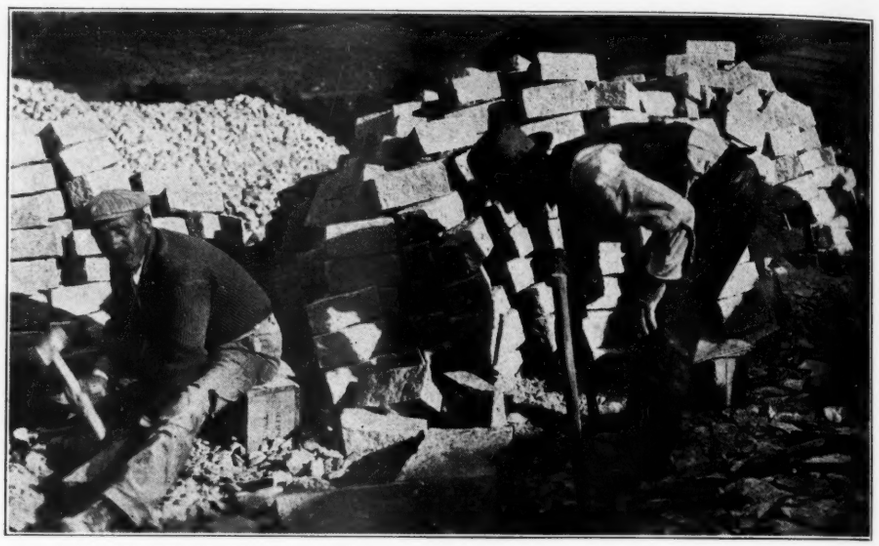
A GOOD SHARE of the crushed stone in the Atlanta market is crushed granite, for there is no limestone nearer than 30 or 40 miles north of the city. From Atlanta east to the seacoast there is practically no quarry stone but granite; likewise there is no quarry stone south as far as Florida but granite.

In a few quarries in this vicinity the granite is produced exclusively for crushed stone and rip rap, notably in Macon, Ga., and Columbia, S. C.; but in the quarries adjacent to Atlanta paving blocks and dimension stone have always been the principal products until the war practically annihilated the demand for these and at the same time created a considerable demand for crushed stone and rip-rap.

Not until this period had these Georgia granite quarries been operated wholly or to a large extent for such a crude product as crushed stone, and it is such a beautiful stone for paving and general building purposes that even the quarry operators feel that it is a kind of sacrilege to quarry the stone for crushing up into road material and concrete aggregate.

Unique Quarry Methods

The granite of Stone Mountain, Pine Mountain, Arabia Mountain and similar deposits in DeKalb County, Georgia, is both the easiest stone in the world to quarry and the most difficult in the world to quarry, all depending upon the purpose for which it is quarried. A few pounds of black powder have often proved sufficient to quarry enough stone to produce from 100,000 to 200,000 paving blocks, whereas many tons of dynamite would not produce an equal amount of stone to feed the crushers.



Making granite paving blocks, Pine Mountain, Georgia; as in the Maine quarries the block makers are mostly Welchmen

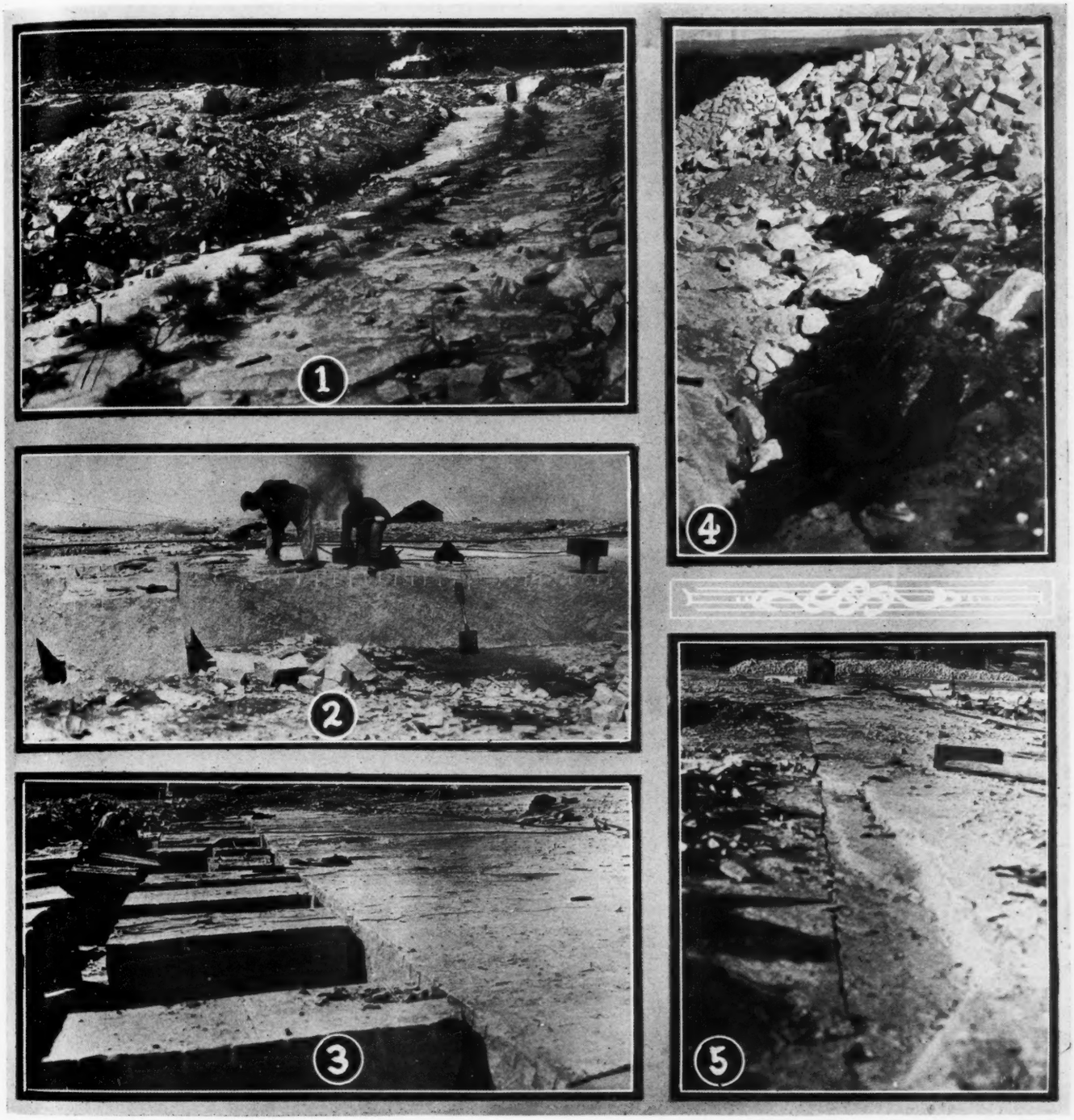
Crushing plant of the Pine Mountain Granite Co., showing character of the material used

Unlike nearly every other deposit of rock on the face of the earth, these Georgia mountains are solid masses of granite without seams, strata or bedding planes of any kind. The result is that stone of any dimension may be quarried. The usual order of things is reversed, instead of adjusting the dimensions of the block to what the quarry can produce, the dimensions are fixed only by what the facilities of the job may be and by the means of transportation and handling.

Separating Immense Blocks with a Handful of Powder

The first step in the quarry operation is to go back 100 to 150 ft. from the working face of the quarry and drill a row of holes about 3 in. in diameter. These holes are often 50 to 100 ft. apart and are drilled as deep as it is desired to make the lift or layer to be separated from the solid mass of rock below the operation.

These holes are then loaded with a small amount of black powder, generally not over a quart, carefully tamped and fired—not once only, for sometimes they are reloaded and fired a number of times. The object, of course, is to avoid shattering the rock and merely to start



(1) Row of holes ready for blasting across end of layer or "li ft;" (2) Drilling for plug and feather splitting; (3) Example of blocks split off with plugs and feathers; (4) Drill holes blasted with dynamite, showing how little effect it has; (5) Straight split 200 ft. long done with plugs and feathers

a bedding crack at the bottom of each of the holes drilled in the granite.

New Use for Compressed Air Supercedes Older Methods

As soon as this is accomplished compressed air is turned into the hole and the temperature changes in the interior of the mass of granite brought about by the warm air do the rest, for the crack will spread uniformly in all directions toward the face of the quarry and upon an almost perfect plane.

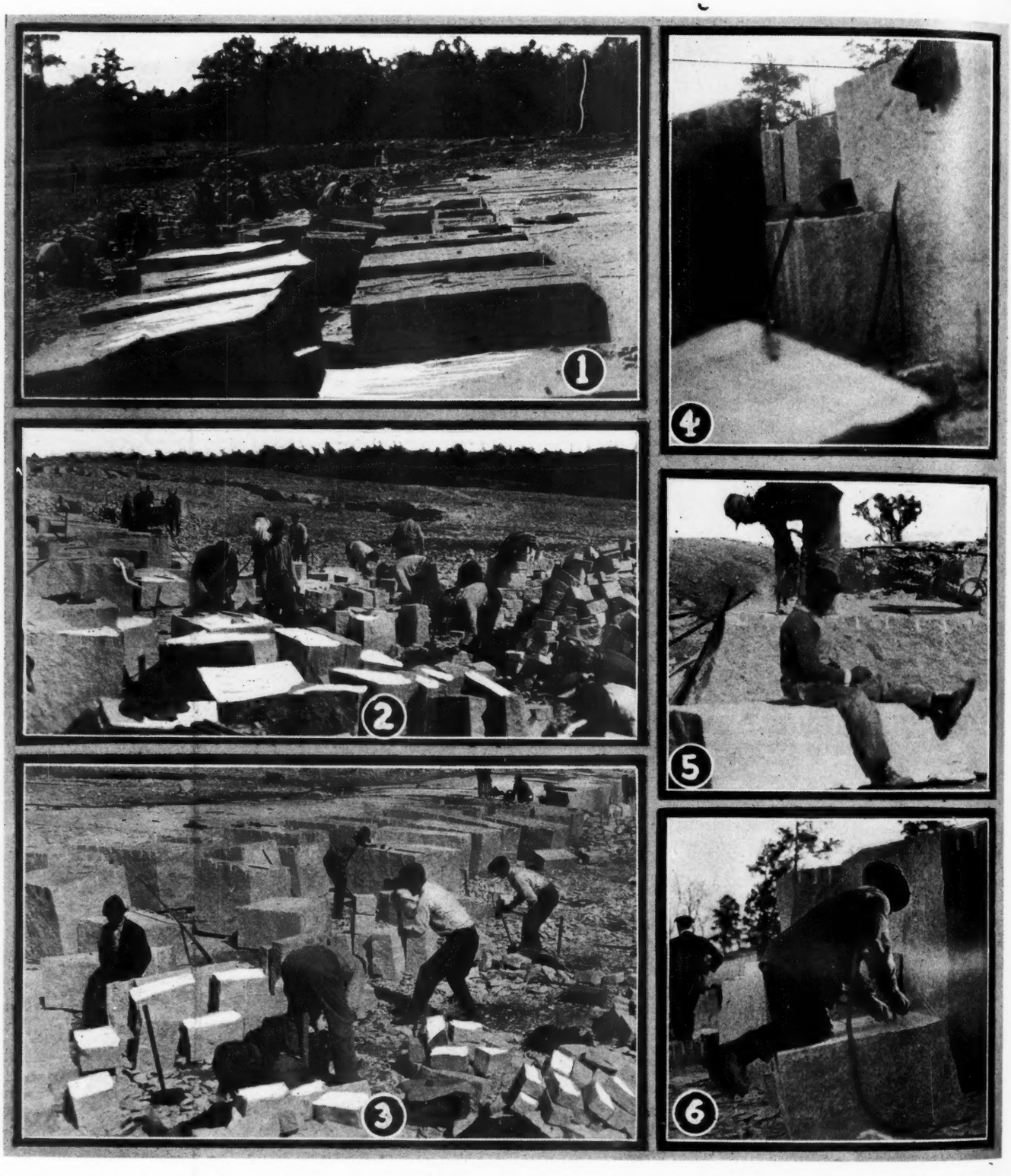
In former times the hole after being fired was left exposed to the warm summer air and the result was the same, although the action was much slower. Later, water was used, but more recently compressed air has been found best for forcing the crack and "lifting" the layer of granite.

Discoverers of Method

The Venable brothers, owners of most of the quarry properties and former operators of the Stone Mountain and Pine Mountain quarries for many years, are credited with having discovered or devised this method of quarrying with compressed air in the Georgia granite district.

Plug and Feather Splitting

Having once separated a stratum or layer of granite, 3, 4, 6 or more feet thick, practically all the other quarrying is done by means of drilling shallow drill holes and the use of plugs and feathers. A split 6 ft. deep and a couple of hundred feet long, made with plugs and feathers, is shown in one of the accompanying views.



(1) Plug-and-feather splitting continued to paving blocks; (2) Another view of the reduction process; blocks this size are split with a "bull" wedge—a single large broad-topped wedge placed in the middle of the block; (3) Final stage of block-making—marking the blocks and splitting with single blow of hammer; (4) Showing working face over 6 ft. high; (5) and (6) Drilling for plug and feather splitting

The only other place where it is necessary to use explosives is where a break across the end of the grain occurs at edges of the "lift." Granite splits very easily and very regularly in parallel planes at right angles to these, but with very great difficulty in all other directions.

Dynamite Has Little Effect on Georgia Granite

One of the accompanying views shows a row of drill holes across one end of a layer of granite and a view beside it shows the effect of blasting such holes with dynamite to form a channel across the grain. The dynamite blows out a narrow trench, but the surrounding stone remains as solid and sound as before.

This illustrates as well as possible the difficulty of quarrying this stone for rip-rap or crushed-stone purposes. The stone having no natural seams or bedding planes requires an enormous

amount of explosives when quarried in the rough.

Dimension Stone Methods for Crushed Stone

Naturally a quarry which has been operated for dimension stone cannot be quarried for crushed stone without a complete change in operating methods and the destruction of the quarry face forever for a return to cut-stone quarry methods. None of the DeKalb County dimension stone quarrymen have felt inclined to devote their quarries wholly to the production of crushed stone, so the result has been that they have clung to the method of plug and feather splitting, even where the blocks were to be later used in the crusher. This accounts in a large measure for the prices of $2.25 to $2.50 per ton quoted for crushed granite in the Atlanta market.

The crushing plants for the most part are not equipped for handling stone larger than 16 or 18 in. in size and the stone is brought to them in wagons.

Indiana Oolitic Limestone Business Outlook Good

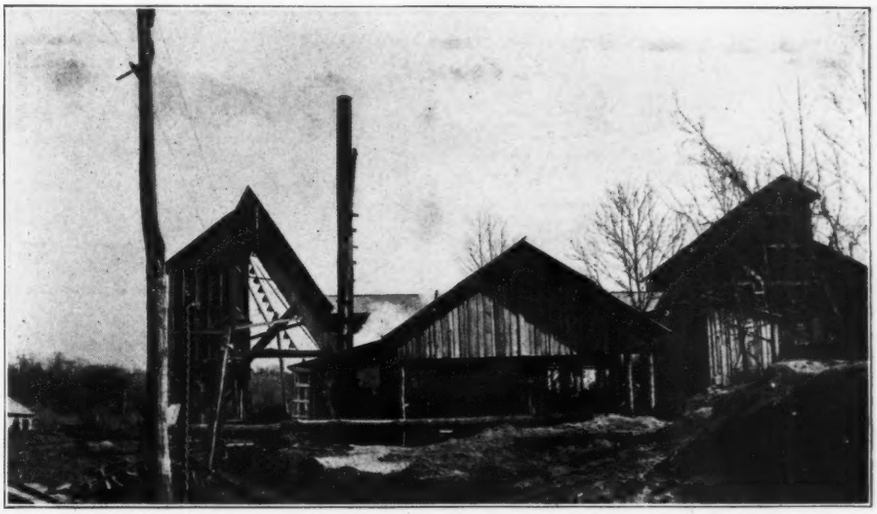
THE EFFECT OF THE WAR on the building stone industry is strikingly shown by the greatly reduced sales of Indiana oolitic limestone, which finds a market in nearly every State in the Union. The total quantity of this stone sold for building in 1918, according to the United States Geological Survey, Department of the Interior, was 2,701,745 cubic feet, valued at $1,820,167, a decrease of 60 per cent in quantity and 44 per cent in value, compared with 1917, the average price at the quarry rising from 47 to 67 cents a cubic foot. About three-fifths of this quantity was sold as rough stone, which decreased 67 per cent in quantity and 66 per cent in value. Dressed or manufactured stone decreased nearly 40 per cent in quantity and 25 per cent in value.

As Indiana oolitic limestone represents more than one-third of the total of all kinds of building stone sold annually, its status is a fair index of the condition of the entire building-stone industry, and it may be estimated, therefore, that the total quantity of building stone of all kinds sold in 1918 amounted to only 7,000,000 cubic feet, valued at about $6,750,000. This estimate is lower than the amount recorded for any year since 1898, when statistics for building stone were first separately tabulated by the Geological Survey, and probably lower than that for any year since 1880, the earliest year for which approximately reliable figures are available.

Outlook is Good

This low ebb, however, is certain to be followed by a rapid rise. Although building of some kinds was very active in 1915 and 1916, the kind of high-class construction that calls for stone has been depressed since 1913. When business in general once emerges from its present state of hesitation, high-class building should not only become normal but should be in extra demand to make up for the five dull years just past. Furthermore, it will not be surprising if, after the last few years of military commercialism and of rapid construction of temporary buildings resulting from it, there should ensue a period of reaction in favor of buildings of higher architectural merit, a reaction which may affect not only the larger buildings but the more modest public business structures and private dwellings. Even a partial realization of these prospects will restore the building-stone industry to the prominence it has always maintained until the recent subnormal period.

ACCIDENTS add to the cost of manufacture without improving the quality of the product. Preventable accidents affect the employer and employee alike. They are unnecessary and can be reduced by better plant conditions, mechanical safety appliances and last, but not least, by the cooperation of the workmen secured through various welfare measures.



Crushing plant of the Arabia Granite Co. near Lithonia, Georgia

Hand-feeding the crusher of the Arabia Granite Co.; one-man size of stone used

One-Third of Pennsylvania Farmers Use Lime

STATISTICS for 1918 show that about 30 per cent of all the farmers in the State of Pennsylvania used some form of lime for agricultural purposes. The average consumption per farmer, however, was only 160 bushels, as compared with 210 bushels in 1917. The decrease is attributed to war conditions—labor scarcity and transportation difficulties—rather than any decrease of interest in agricultural line.

Hints and Helps for the Plant Superintendent

Simple Method of Drying Stone Before Pulverizing

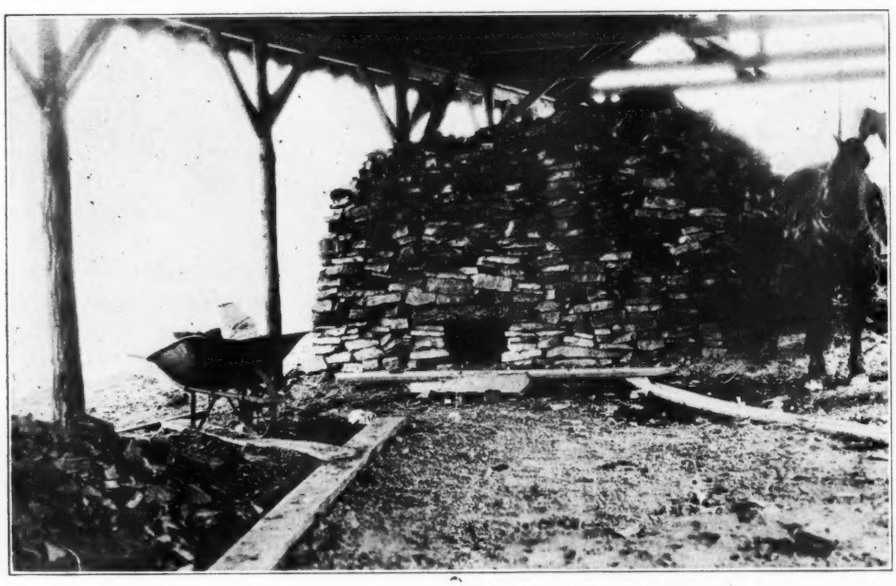
A METHOD of drying phosphate rock, before crushing and pulverizing it, is practiced in Tennessee, which, while it may be crude, is yet effective and requires no machinery. The same method, of course, could be used by agricultural limestone operators to dry quarry stone in damp weather and thus make it possible to operate continuously.

All that is required is a roof of some kind and a dry spot of ground. The pieces of stone are roughly stacked in the form of a rude kiln over a sufficient amount of cord wood to accomplish the purpose, which, of course, is not to calcine the material but merely to drive out excessive moisture.

The amount of wood required will depend upon conditions and the character of the material. In the phosphate fields the fire lasts from 24 to 48 hours.

The material has to be stacked by hand and the expense is much more than where a rotary or tower dryer is used, but the scheme could be used in emergencies of very wet material or very wet weather, where the plant employees draw their pay whether they are busy or not.

Exterior view of structure used for drying rock



Close-up of simple rock drying method practised in Tennessee

To Practice Economy in the Upkeep of Wire Ropes

THE EXPENSE OF UPKEEP of the wire ropes is necessarily large, but much expense can be obviated by the selection of sheaves of proper size. The diameter of the running sheave, if possible, should be at least forty times the diameter of the rope; thus, for a 1-in. rope a sheave having a diameter of 40 in. should be used. It is of course impracticable with some equipment to carrry out this proportion. However, in many instances where large lines and small sheaves are used the life of rope would be lengthened if the rope were smaller. This factor is less important in standing ropes, or those used as guys. The strength of a rope where it bends around the sheave diminishes directly as the size of the sheave is decreased, that is, the bending stress around a 12-in. sheave is twice as much as around a 24-in. sheave.

Almost as important as the selection of the proper kind of rope is the care given it in use. A proper lubricant, of which there are a number on the market, should be freely employed and will increase the life of the rope.

Manganese Sheaves

Manganese sheaves are easier on the ropes as they wear smoothly and in the grooves there is an absence of the ridges so common on cast-iron sheaves after they have become worn. Each sheave should be ground in the bore and a bronze or an iron bushing should be pressed in. Cast-steel sheaves are preferable if they are not subjected to wear.

The use of a socket on a rope in a permanent position is good practice provided the rope is properly put in place. The end of the wire should be spread out and washed with muriatic acid, then

placed in the socket and zinc or spelter poured in. Lead or babbit should not be used nor should the wire be bent back. The object of using zinc or spelter is that either fuses to the wire, whereas lead depends upon the friction between it and the wires for holding power. Failure to fasten a rope properly in the socket has been the cause of several serious accidents.

Overheating of Rock-Breaker Pitmans

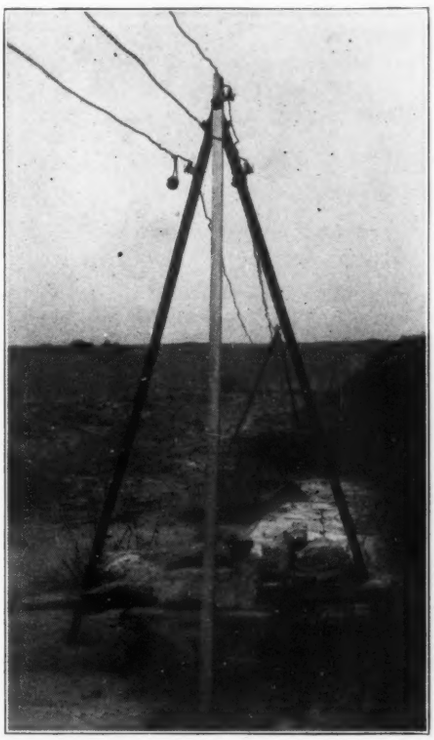
HEATING OF THE PITMAN in the swinging jaw type of rock breaker is common, and usually results from faulty or uneven bearing surface, inefficient lubrication, dirty lubricant, and unprotected grease cups or oil reservoirs. Troubles arising from such causes may be reduced to a certain extent, but, nevertheless, the heating usually persists, despite ordinary precautions and normal attention. Water-cooled pitmans are desirable, and there is no particular reason why they should be considered only with large sizes and types of such machines. As a matter of fact, conditions around the primary crushing department of a small plant are usually conducive to overheating of bearings, and the duty expected is often continuous and, comparatively speaking, severe.

Question Box

GOT a problem you want help on? Send it in. We will agree to find some operating man who can answer it.

Electric Power Cables in Quarries and Pits

POWER CABLES for operating electric well drills and other pieces of movable machinery in quarries and gravel pits are frequently laid on the ground. This is a bad practice, both because it shortens the life of the cable and causes loss of power through possible short circuits and grounding and because it is dangerous to the workmen.



One of the tripods used to carry power cables in France Stone Co. quarries

In wet weather particularly it is dangerous to have a cable carrying from 250 to 440 volts around under foot. There is always sure to be some place where the insulation is worn off or worn thin.

To overcome all these disadvantages a simple tripod tower has been used at all the quarries of the France Stone Co. and allied companies for some time. A detail drawing is shown herewith and also a view of one in use.

The platform of the tower is anchored with pieces of rock loaded on it temporarily, but the whole tower is easily moved from one location to another as the occasion demands.

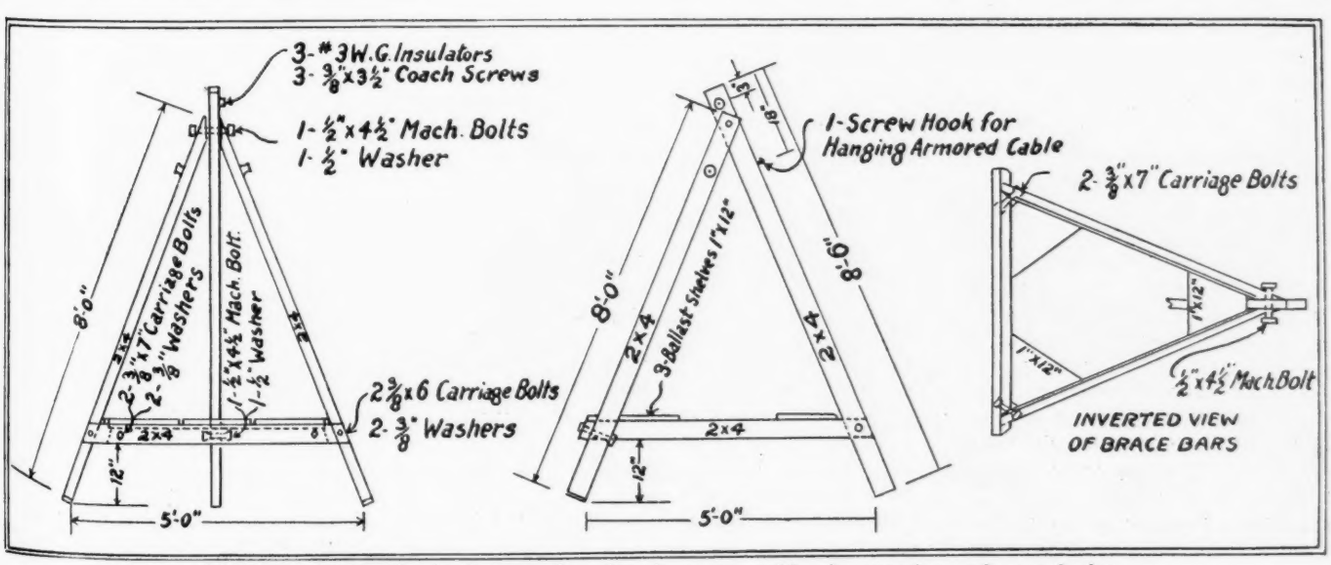
The amount of material required to make one tripod is as follows.

- 2 ½x4½-in. machine bolts.
- 2 ⅜x6-in. carriage bolts.
- 2 ⅜x7-in. carriage bolts.
- 2 ½-in. washers.
- 4 ⅜-in. washers.
- 3 ⅜x3½-in. coach screws.
- 3 No. 3 W. G. insulators.
- 2 pieces lumber 2x4 in. x 16 ft.
- ½ piece lumber, 2x4-in. x 18 ft.
- 1 screw hook, No. 602, B.-B. Co.
- 3 ft. lumber, 1x12-in.
- 2 coats of paint.

This tripod tower was designed by D. M. Yambert, electrical engineer of the France Stone Co., Toledo, Ohio.

Sun Strokes in Quarry and Pit Operation

THE SUPREME COURT of Massachusetts has decided that an employe who sustains injury from sunstroke while working in a sand and gravel pit, where he is subjected to a greater danger of sunstroke than the ordinary outside worker, cannot recover under the workmen's compensation act if he could leave the work when he felt affected by the heat.



Working sketch of tripod tower for electric power cables in quarries and gravel pits

Washed Sand and Gravel Are Best For Gravel Road Building

Quality of Materials Is Just as Important for Good Results as When They Are Used for Concrete Aggregates

By J. R. Gregory
County Engineer and Surveyor,
Warren County, Indiana

AT THE PRESENT TIME when there is so much talk of permanent pavements and main market roads, one wonders what is to become of the farmer who is so situated that his farm lies away from the line of the hard pavement and who can only reach it by traversing perhaps a mile or two of dirt and mud.

No one doubts the wisdom of selecting the most durable pavements where the traffic is fast and heavy, but the present cost of placing a brick or concrete pavement is such that it is out of the question to think of giving every man a hard road outlet without in effect mortgaging the land and income of the people for years to come. Besides common sense demands that the roads be built to keep in mind the volume and weight of traffic existing at present and what might be expected for several years to come.

The Place of the Gravel Road

There are many taxpayers in our several communities who declare that the day of the gravel road is past and cite the fact that many of our main roads carrying heavy traffic have become rutted, pitted and chucky in the winter time and rocky and dusty in the summer. But they do not also state the fact that most of these main roads were built twenty or thirty years ago, and that at the time of building no suitable drains were provided and what drains may have been built at the time of construction have perhaps filled up; and in many places the present center line of the roadway may be lower than the side drains, thus giving no drainage whatever. In those days no attention was given, as a rule, to the quality or grading of the road material. Everything was called gravel that ranged from fine sand to small boulders. Nor was any care taken to restrict the amount of clay or other materials in the wearing surface.

This type of road under our present day traffic is bound to "go to pieces," and it is only a question of time until such roads are in the discard. But gravel roads have been built and will continue to be constructed that, with reasonable attention, will prove highly satisfactory improvements. The trend today on construction of gravel roads is for hard, durable and well graded materials, with all excess dirt screened or washed out and the sand only retained in the proper proportions.

Warren County Experience With Washed Gravel

The first road in this county (Warren County, Indiana) constructed entirely of graded and washed materials was the Johnson Gravel Road. built in the years 1908 and 1909. It is 4.47 miles long and was constructed for the contract price of $10,739.

It is impossible to give the exact cost of maintenance, for the reason that during the first six years after the road was constructed no record was kept of the amount spent on each road separately, and later accounts kept by the highway maintenance department of the county show only amounts drawn for grading and dragging. However, I know it to be a fact that this road for the ten years it has been traveled since construction has not had spent upon it more than an average of $20 per mile per year.

Yet this road for years was the only improved road that carried the automobile traffic throughout the county between two cities of 30,000 population. Over this road is carried each year a considerable tonnage of grain from a large producing district, and in addition thousands of cubic yards of gravel have been hauled over it. Also, within the last few years the railroad station situated at the center of the road has become a shipping point for a large amount of ties and logs. By necessity, this timber was transported over this highway.

It is true that during one very dry summer, besides carrying the normal traffic of the community, several thousand yards of gravel were also hauled during a comparatively short time, and the road surface in places was broken up and appeared in very bad condition. However, after this rush was over, the road gravel was graded back into place, and the rains and travel soon placed it in as good condition as before. Had the original materials not been free from an excess of clay, it is my opinion that the road would never have held up as well as it did nor have remained in its present condition with the amount of traffic now on it.

Largest Size Material 2 Inch

Since this road was built we have constructed several additional gravel roads of washed materials in the county, and we have found that it is best to have all rock that will not pass a 2-in. ring screened out and crushed to 1½-in. pieces and dust. This product is then placed back in the main body of the material, which has been washed, screened and graded, and as the gravel is loaded into the cars the proper amount of sand is added.

The sand in no case should be less than 35% of the total volume nor more than 40%. This mixture we find packs much more readily under traffic, gives a strong bond and tends to hold the road material on the road in better shape than gravel containing a high per cent of rounded particles such as one finds in the common run of bank gravel.

Another good point in favor of the washed gravel for road purposes, is the fact that when packed it presents and holds a smooth hard surface that is not found in our gravel roads which contain a high per cent of clay binder.

Raised Roadbed Best Construction

All gravel roads in this county are of the surfaced type, some having graded a small berm next to the base of the gravel to prevent the materials from spreading. We find that this gives us better results than the trench gravel road for our ordinary country highways for the grade is sloped sufficiently to cause the water to drain well to the side drains, which are made ample to remove all surface water to the outlet. With the surface gravel roads it is much easier to work the road materials into shape with drag or grader without picking up sod and soil and dropping them upon the roadway to form mud holes later. Surface gravel roads as a rule, all other conditions being the same, remain more firm and the grade dries out much faster than trench gravel roads in cases where sub-drains are not used.

Gravel roads will continue indefinitely to be built as feeders for our main trunk lines. But we must use the best mate-

rials and provide adequate drainage.

Should Be Guaranteed

Proper grading and elimination of all excess clay and other materials deleterious to the completed work should be guaranteed. Good sharp materials, in both sand and gravel, will be found to be more satisfactory to the endurance and smoothness of the finished surface. And finally, the saving in interest alone on first cost of a good gravel road over that of a hard pavement will several times over more than maintain and keep the road in first class condition, if proper superintendence is provided.

Ohio Silica Sand Men Show Interest in Compensation Insurance

Believe State Industrial Commission Is Overcharging Them—Specifications for Foundry Sand Discussed

AT THE REGULAR MEETING of the American Sand Association, held in Cleveland, Ohio, May 14, the chief subject discussed was the cost of workmen's compensation or employers' liability insurance under the state insurance plan of the Ohio Industrial Commission.

As with the limestone quarrymen, whose case is discussed in ROCK PRODUCTS, April 26, and elsewhere in this issue, the silica-rock quarrymen, represented by the American Sand Association, have been undergoing steady increases in insurance rates, which, added to the doubling of the payrolls in the last year or two, has put the cost of industrial insurance beyond all reason, they believe.

Losses Exceed Premiums

At present they are paying the same rates as limestone quarrymen, namely, $4.10 per $100 of payroll; and their experience statistics show losses in excess of the 1918 premiums. Several members of the association gave the experience of their own companies, which showed premium payments far in excess of their losses.

A resolution was adopted requesting the secretary of the association, Hubert B. Fuller, to pursue the matter further, to collect the experience records of the members, and to attempt to find where the leak was.

Specifications for Foundry Sand

Considerable discussion was aroused by the reading of an editorial from "Foundry," in which the lack of precise knowledge of foundry sands was pointed out. Up to this time it seems that the producers of foundry and molding sands have taken no active interest in getting at this problem, although it has received some attention from foundry men.

It was voted to cooperate with the American Foundrymens' Association in an attempt to arrive at some standard specifications and definitions of foundry and molding sands. It was also decided to have the secretary of the association join the American Society for Testing Materials, and to bring to the attention of that organization the desirability of working out some standard specifications for sands.

Co-operate with Illinois Association

One of the guests of the meeting was Paul L. Vittur, Ottawa, Ill., secretary of the Silica Sand Association of Illinois, who spoke on the possibilities of the two silica sand associations cooperating for specific purposes. Each association has taken out associate membership in the other association and there has been some visiting back and forth. It was voted to hold the next meeting of the American Sand Association in Chicago and in conjunction with a meeting of the Silica Sand Association of Illinois.

Hubert B. Fuller
Secretary of American Sand (Silica) Association

Other matters discussed at the meeting were the general business conditions in the silica sand industry, which have undergone something of a slump since the end of the war activity in iron and steel.

One of the guests of the meeting was the editor of ROCK PRODUCTS, who spoke on conditions and prospects in the allied rock products industries and the aims and purposes of trade associations. In this connection there was considerable discussion of the open-price policy of competition, but no definite action was taken toward its adoption by the association.

Sand for Sand-Blast

THE FOLLOWING QUALITIES are desirable for sand for use in foundry sand-blast work, according to H. D. Gates, Hagerstown, Md., in an address before the Newark Foundrymen's Association:

"Various classes of sand are now mined and graded for sand-blast use, and with the abrasive, as with the equipment, the better the quality the greater economy and efficiency. The sand which is hard, sharp, clean, with the least disintegration, not only shows longest life and highest abrasive quality, but creates less dust. River or bank sands are rarely economical, even at lowest first cost. Ocean sands are quite satisfactory, but undoubtedly the white silica sands where available are most desirable. In fact, by their hardness and uniformity they would undoubtedly prove most economical at a considerably higher first cost."

The Illinois Sand and Gravel Producers

Association Officers of New Live Organization

M. D. Schaff, Springfield, president

AS AN EXAMPLE of effective organization, one might confidently point to the successful formation of the Illinois Sand and Gravel Producers' Association. Yesterday, unknown among producers; today, assuming a position among leaders in business organizations.

It has a record of achievement in organization that stands unequalled. In two short years, while barely attracting any notice beyond those actually approached on the matter, it has taken into its fold nearly every producer of sand and gravel in Illinois outside of the purely Chicago district, and that district it left entirely alone. The membership roll discloses members from Indiana, Missouri and Iowa, those who do business in Illinois or have pits in that state.

But greater than this feat of organization is the harmonious character of the organization—the members have all gotten together in a whole-hearted spirit of cooperation. They have agreed and have obtained memberships on the principle of helping one another. They have outlined a program of cooperative effort and have established headquarters in Springfield, where their business director, Ben Stone, is in charge. Here and through him the many plans will be worked out.

The successful completion of the organization might be fairly credited to its officers, past and present, but these same officers, while admitting their participation in developing the association, modestly point to the willingness and spirit of helpfulness of the membership as counting for so much in its success.

M. D. Schaff

M. D. Schaff, at the head of the Virginia Timber Co., Springfield, is president of the association.

For many years, up to the time he entered the sand and gravel business, Mr. Schaff was division superintendent of the Chicago, Peoria & St. Louis Railroad. When, through some legal enactment, the railroad had to dispose of its railroad ballast deposit, Mr. Schaff and Mr. Sowers, also of the same railroad, bought it. The pit, in which they have built three plants, is at Crescent, near Pekin.

Previous to the taking over of the sand pit, Mr. Schaff and Mr. Sowers had organized the Virginia Timber Co., of Virginia, Ill., a lumber concern which produced railroad ties and mine props. They retained the name for the sand and gravel business.

James P. Pearson, Moline, vice-president

James P. Pearson

James P. Pearson, vice-president of the association, is one of the leading business men of Moline, Ill. His activities are numerous and his name is found on the directorates of many corporations.

The Moline Consumers Co., of which he is president and manager, was organized two years ago by the consolidation of the Moline Sand Co. and the Moline Channel Ice Co., both old and prosperous concerns. The Moline Sand Co. began business eleven years and the ice company twenty-nine years ago. As both these concerns had been organized and developed under the direction of Mr. Pearson, who was manager and president of both from the beginning, the consolidation presented no difficult problem. The company owns a gravel plant in Moline and another in Ottawa.

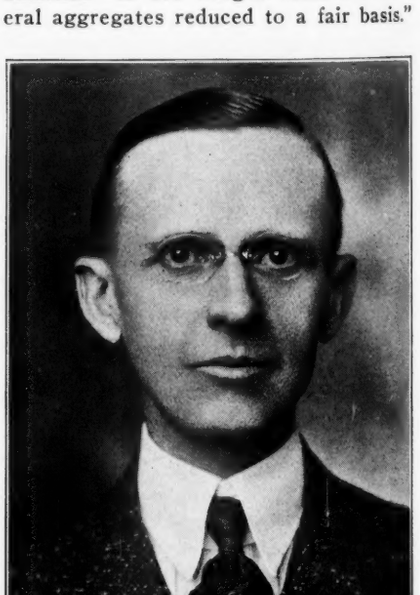
Mr. Pearson is also president of the Western Mausoleum Co., president of the Moline Oil Co. and vice-president of the Mechanics & Merchants Savings Bank.

"I have been in business nearly thirty years and am rather old in the business, but still young—only fifty," he says. His experience evidently has taught him the value of cooperation.

J. C. Brandt

J. C. Brandt, secretary-treasurer of the association, is general manager of the Lincoln Sand & Gravel Co., Lincoln, Ill. Previous to assuming this position, he held that of manager of the Sabula Sand & Gravel Co., Sabula, Ia., one of the series of four plants owned by the same company of which he is now general manager. Mr. Brandt is an enthusiastic and hard worker for the association and has given considerable of his time to it.

His associate, V. O. Johnston, president of the four companies and a director of the association, says of him: "Mr. Brandt is happily married, has no bad habits and spends his money on Boston Bulls. At present he has but one ambition—to see freight rates on mineral aggregates reduced to a fair basis."



J. C. Brandt, Lincoln, secretary

Silica Rock Industry Holds Nearly All Its Great Pre-War Gain

Production Analyzed For First Time to Show Various Uses and Their Relative Importance

THE GANISTER OR SILICA ROCK used in the United States in 1918 for making silica brick ferrosilicon, and furnace and converter linings amounted to 1,273,800 short tons, valued at $1,668,192, according to statistics compiled under the direction of G. F. Loughlin, of the United States Geological Survey, Department of the Interior. The quantity produced is 2 per cent less than that produced in 1917, and the decrease shows a check on the rapid development of this industry, which in 1917 and 1916 increased its output 51 and 50 per cent, respectively, over that of the previous years. In 1918 the value increased 23.5 per cent; in 1917 it increased 155 per cent, and in 1916, 58 per cent. In 1918 the average price per ton was $1.31; in 1917 it was $1.04; and in 1916 it was 62 cents. The advance in price in 1918, as in 1917, was due mainly to increase in the cost of production, and the decrease in output was due to scarcity of labor and the cessation of demand after the armistice was signed, in November, 1918.

First Record of Output by Uses

In 1918, for the first time, the statistics of ganister were assembled to show the production of the stone according to uses, and the result is given as follows:

In 1918, 55 plants reported operations, 30 of which were in Pennsylvania, 6 in Wisconsin, 5 in Colorado, and 3 in Ohio; and the remaining plants in 8 other states, in none of which were there more than two companies.

Pennsylvania

Pennsylvania produced 77 per cent of the total output in 1917 and 67 per cent in 1918, Pennsylvania's production for the last three years being as follows:

Year	Quantity Short tons	Value	Average price per ton
1916	675,424	$ 410,541	$0.61
1917	1,001,630	1,114,696	1.11
1918	853,724	1,134,617	1.34

These figures show an increase in quantity of 48.3 per cent in 1917 and a decrease of 14.7 per cent in 1918. The value, however, increased 171 per cent in 1917 and 1.8 per cent in 1918. About 81 per cent of the total output in 1918 was used in the manufacture of fire brick, about 13 per cent for furnace and converter linings, and 6 per cent for ferrosilicon. Pennsylvania is the largest producer of each of these products, 30 plants reporting operations in 1918, of which 4 were new. One plant that was working in 1917 was idle in 1918. Huntingdon County produced 417,252 short tons, valued at $517,907, of which all but a very small part, sold for furnace and converter linings, was used for silica brick. Blair County produced 261,459 short tons, valued at $364,830, of which 209,189 short tons, valued at $281,960, was used for silica brick, and the remainder, except a small quantity used for furnace and converter linings, went into ferrosilicon. Bedford County, with an output of 105,347 tons, valued at $128,654, used a small quantity for ferrosilicon and about equal quantities for silica brick and furnace and converter linings. The remainder of the output of Pennsylvania came from Carbon, Center, Fayette, Lancaster, Lawrence, Mercer, Mifflin, and Somerset counties.

Wisconsin

The production of ganister in Wisconsin, where 6 plants were in operation, increased 24 per cent in quantity and 82 per cent in value in 1918. Practically all the output was used in making silica brick, a small portion being used for furnace and converter linings. The producing localities were Grand Rapids, Wood County; and Ableman, Devils Lake, and North Freedom, Sauk County.

Ohio

Ohio, the third largest producer, reported sales of 47,420 tons of stone, valued at $101,681, all used for furnace and converter linings. This stone, unlike that produced in the other states reporting sales of ganister, is not quartsite but the well-known sandstone of northern Ohio, used principally as a building stone or for making grindstones. The producing localities were Leavittsburg, Trumbull County, and Amherst and North Amherst, Lorain County. This is the first time that the total production of this stone for this use has been reported.

Colorado

Colorado, the only other State whose output can be reported separately, produced 43,051 short tons, valued at $56,163, in 1918. These figures show an increase of 22 per cent in quantity and 75 per cent in value over 1917. This stone all came from the vicinity of Canon City, Fremont County, and from Stone City, Pueblo County. More than half of the product is used for silica brick and most of the remainder is sold to steel plants for furnace lining, only a small portion being used in the manufacture of ferrosilicon.

Other States

The production of ganister in Illinois, South Dakota, Tennessee, and West Virginia increased in both quantity and value, and that of Alabama and New York decreased. Minnesota, for the first time, reported the sale of blocks for furnace and converter linings from the quarries at Sandstone, Pine County. The material quarried near Rock Run, Cherokee County, Ala., was used in the manufacture of fire brick. Illinois produced a cherty rock, locally called "novaculite," in Elco and Tamms, Alexander County, which was used in the manu-

Production of ganister in 1918.

State.	Ganister used for— Silica brick. Quantity.	Silica brick. Value.	Furnace and converter linings. Quantity.	Furnace and converter linings. Value.	Ferrosilicon. Quantity.	Ferrosilicon. Value.	Total. Quantity.	Total. Value.
	Short tons.		*Short tons.*		*Short tons.*		*Short tons.*	
Pennsylvania	688,105	$885,164	110,831	$159,726	54,788	$89,727	853,724	$1,134,617
Wisconsin	254,602	282,224	21,822	21,536			276,424	303,760
Ohio			47,420	101,681			47,420	101,681
Colorado	25,627	43,106	17,424	13,057	(a)	(a)	43,051	56,163
West Virginia, Maryland, Tennessee	14,818	18,216	(b)	(b)	6,486	10,588	21,304	29,804
Undistributed d	22,296	32,705	(c)	(c)	9,581	9,462	31,877	42,167
	1,005,088	1,262,156	193,563	293,517	75,149	112,519	1,273,800	1,668,192
Average price per ton		1.26		1.52		1.50		1.31

a Included under furnace and converter linings.
b Included under silica brick.
c Included under ferrosilicon.
d Includes Alabama, Illinois, Minnesota, New York, and South Dakota.

facture of silica brick. The product of Maryland came from the vicinity of Cresapton, Allegany County, and was used in the manufacture of ferrosilicon. The quarry at Bloomington, Garrett County, was idle in 1918. In New York ganister was quarried near Johnstown, Fulton County, and was used in the manufacture of ferrosilicon. The product of South Dakota was quarried near Sioux Falls, Minnehaha County, and was used about equally in the manufacture of silica brick and ferrosilicon, though a quantity of cut jasper was sold for furnace and converter linings. Tennessee produced a small quantity of ganister in the neighborhood of Alton Park, Hamilton County, which was used for furnace lining. West Virginia more than tripled its production in 1918, and the value of its product was nearly six times as much as in 1917. It was quarried at Great Cacapon and Berkeley Springs, Morgan County, and was used in the manufacture of silica brick and ferrosilicon.

Cement and Gypsum Sales in Canada, 1917-18

TORONTO, Ont.—Cement sold from Canadian cement mills in 1918 brought an average of $1.97 per bbl., as compared with 1917 when an average of $1.62 per bbl. was obtained. The decrease in the quantity sold was 1,177,007 bbls. or 24.68 per cent and a total decrease of $647,743 or 8.38 per cent. This is due to the stoppage of all public works in 1918 due to war effort. In 1919 there are a great many immense undertakings planned and the output of cement will, of necessity, be greatly enlarged.

Sales by Provinces

Sales of cement from mills in Quebec in 1918 were 1,564,360 bbls., valued at $3,003,571; in Ontario of 1,220,003 bbls., valued at $1,976,815 and from Manitoba, Alberta, and British Columbia 807,118 bbls., valued at $2,096,117.

Total Made

The total quantity of cement made in 1918 was 3,417,660 bbls. as compared with 4,987,255 bbls. in 1917, a decrease of 1,569,595 bbls. or 31.47 per cent.

Stocks of cement on hand January 1, 1918, were 1,660,406 bbls. and at the end of December, 1918, had been reduced to 1,480,565 bbls.

Total Imports of Cement

The total imports of cement in 1918 were 20,695 cwt. equivalent to 5,913 bbls. of 350 lbs. each, valued at $19,851, or an average of $3.36 per bbl. as compared with imports of 8,580 bbls. valued at $19,646 or an average of $2.29 per bbl. in 1917.

The total consumption of cement, therefore, disregarding a small export was 3,603,414 bbls. as compared with a consumption of 4,777,068 bbls. in 1917, showing a decrease of 1,173,654 bbls. or 24.57 per cent.

Gypsum Production Low in 1918

Because of the general cessation of building activities during the war, the production of gypsum also fell in 1918 to less than one quarter the tonnage mined in 1913.

The total quantity of gypsum block quarried in 1918 was 155,298 tons of which 88,748 tons were calcined. The shipments of all grades totaled 152,287 tons valued at $823,006, and included lump gypsum, 43,728 tons valued at $47,727; crushed, 25,074 tons, $55,079; fine ground, 4,558 tons, $12,621; and calcined, 78,927 tons, $707,579.

By provinces the shipments were: Nova Scotia, 49,365 tons, $115,976; New Brunswick, 27,225 tons, $214,114; Ontario, 38,214 tons, $151,564, and Manitoba, 37,483 tons, $341,352.

Gypsum Production in 1917

In 1917 the quantity quarried was 365,659 tons, of which 97,667 tons were calcined. The shipments included: Lump, 223,760 tons valued at $246,774; crushed, 32,305 tons, $51,869; fine ground, 4,843 tons, $19,222; and calcined, 75,424 tons, $564,119; or a total of 336,332 tons valued at $881,984.

The average number of men employed in 1918 was 435 and wages paid $273,728 as compared with 774 men employed and $445,128 paid in wages in 1917.

Gypsum Exports

Exports of crude gypsum were 67,824 tons value at $80,843, and of gypsum ground, value, $101,618. The corresponding exports in 1917 were: Crude gypsum, 224,423 tons valued at $245,182 and ground gypsum, value, $146,384.

The imports of gypsum of all grades during 1917 were valued at $22,065 and included: Crude gypsum, 112 tons, $2,015; ground gypsum, 79 tons, $1,836, and plaster of Paris,, 1,095 tons, $18,214. The total value of the imports in 1917 was $35,460.

U. S. Engineer Writes of Army Road Making in France

THAT the men who have seen service in France will lend their influence to every movement for building "better roads and more of them" when they return to the United States is the opinion of Major D. D. Guilfoil, commanding the First Battalion of the 108th Engineers, in a letter to J. A. Sauerman of Chicago.

From Echternach, Luxembourg, under date of January 22, he writes as follows:

"That Illinois bond issue sounds good to me. Really believe that you will find an increase in the demands for more road improvements when the army gets back for there is not a man over here who personally has not experienced the benefits of good roads and the discomforts of bad ones. What is more, it has been brought home to them in such a way that the war side of it will be entirely removed and they will want the good roads purely from an economic point of view.

"I have built roads out of every conceivable material. There is one little ruined French village that once had a fine large church. This church together with all the other buildings had been more or less shot to pieces. Mostly more. Today you will find the church and several other buildings are the component parts of a very fine road that we built through that section when our troops advanced. Many and many a time have I thanked whoever is to blame for the fact that nearly all the villages are built of stone. When we arrived at that spot the road had entirely disappeared, shell holes and road mines for 1 kilometer, and the Boche had flooded the section with 18 inches of water. Three hours after we put over the first horse transport and seven hours after we put over a train of 65 motor trucks. You see we couldn't wait for material to come up from the rear."

Major Guilfoil is well known in the Chicago territory as sales engineer for Sauerman Bros. He was First Sergeant in the original Company A, First Battalion, I. N. G., which was organized in 1911-1912 by Col. Henry A. Allen and H. B. Sauerman, who was the commanding officer from 1912 to 1915. This organization was the nucleus of the 108th Regiment of Engineers which was recruited in Chicago and sailed for Brest, France, in May, 1918. Major Guilfoil served as Captain of Company "C" of this regiment in the Verdun sector and was promoted to Major in October, 1918.

Cuba Promising Field for Cement Makers

ST. LOUIS, Mo.—The great opportunity for American industry in Cuba, especially as regards cement production, was discussed by P. T. Bolz, president of the Bolz Cooperage Co., upon his return from Cuba recently. "One of the recent developments is the construction of two cement plants in Cuba with a capacity of 3,000 barrels a day," he said. "Cement sells for $5.00 a barrel there, but at that price it is cheaper than imported cement.

Ground Limestone and Raw Rock Phosphate

Nature's Fertilizers for Increased Crop Yields

By Robert Stewart
Department of Soil Fertility, College of Agriculture, University of Illinois

FINELY GROUND LIMESTONE AND ROCK PHOSPHATE applied to the normal soils of the United States markedly increase the yield of crops at a profit to the farmer. This has been confirmed repeatedly by the results obtained by practical farmers of Illinois and by the large mass of data accumulated on teh experimental farms of the University of Illinois. For example during 1918 the average yield of wheat obtained from ten experimental farms in "Egypt" with different treatments were as follows:

	Bushels
No treatment	6.2
Organic matter	8.0
Organic matter and limestone	16.0
Organic matter, limestone and phosphate	20.0
Increase for limestone	8
Increase for phosphate	4

On fourteen experimental farms in the corn belt of Illinois the following results were obtained by the use of nature's fertilizers:

	Bushels per acre
No treatment	29.2
Organic manure	33.5
Organic manure anl limestone	36.1
Increase for limestone	3.6
Increase for phosphate	4.6

These results were obtained by the yearly application of 1,000 lbs. of finely ground limestone and 500 lbs. of finely ground natural rock phosphate.

Returns Farmer 500 to 700 Per Cent

The cost of limestone and phosphate applied will vary with the year and location of the farm. However, using the maximum prices of the present time of limestone $2 per ton and phosphate of $9 per ton the annual cost of the materials used to get the above results would be limestone $1 and phosphate $2.25 or total $3.25. This investment, with wheat at $2 per bushel would yield a return of $24 when applied to land in southern Illinois and $16.40 when applied to land in the Illinois corn belt.

Of course in this time of high and variable prices it may be dangerous to draw general deductions from the use of these prices, but it may easily be seen that handsome profits were obtained by the use of limestone and phosphate in the growth of wheat. Similar results are obtained by the growth of corn, oats and hay.

It should be kept in mind also that the amount of materials used especially in the case of the phosphate are in excess of the immediate requirements of the crops and that the residual effect of the phosphate is also very important. Thus at the Ohio Station 5,000 lbs. of rock phosphate per acre was used in a comparison with limestone.

Thirteen Year Test

Director Thorne in discussing these results says, "During the 13 years of the test 5,000 lbs. of rock phosphate have been used per acre, at a cost of $25 spread on the land. It has produced a total increase worth $66 per acre over the yield of the land that has been dressed with limestone instead of the phosphate rock. It is evident that the rock phosphate has been used with profit, and the outcome in 1917 wheat crop, the seventh crop since the last application of rock phosphate, shows that the returns are not all in. In this crop the increase from rock phosphate has been 11.54 bushels over the yield of the limed land, or 18 bushels over the probable unlimed yield, which, at $2 a bushel, would pay the whole phosphate bill for the 13 years and half as much more."

Degree of Fineness Necessary

If such important practical results may be obtained by the use of finely ground limestone and phosphate it becomes a question of extremely great importance to determine the degree of fineness necessary to grind the material in order to get the best results. How fine should limestone be ground for use on acid soils? One of the University of Illinois experimental fields at Newton in Jasper County is devoted to experimental work to determine among other things the answer to this question. The work was commenced upon this field in 1912 with four specially prepared kinds of finely ground limestone together with burnt lime. The following degrees of fineness were employed:

No. 1	¼-in. down (mill run)
No. 2	¼ to 1/10-in.
No. 3	1/10-in. down
No. 4	1/50-in. down
No. 5	Burnt lime

The limestone was applied in light, medium and heavy applications of 500, 1,000 and 2,000 lbs. per acre per year. An analysis of the soil in 1916 for limestone present and acidity destroyed gave the following results:

	Limestone Found				Pounds per acre
Application	¼ down	¼ to 1/10-in.	down	1/50-in.	Burnt lime
Light	617	1151	631	272	392
Medium	1613	2117	1025	659	648
Heavy	3899	4776	3558	3545	1822
	Acidity Destroyed				
Application	¼ down	¼ to 1/10-in.	down	1/50-in.	Burnt lime
Light	631	620	709	637	746
Medium	863	1059	925	855	1006
Heavy	1368	1443	1458	1492	1634

Trustworthy Tests

These result are the average from six separate plots uniformily treated and therefore represent trustworthy results and may be relied upon as indicating the comparative value of the various kinds of limestone for destroying soil acidity. The results indicate clearly that the ¼-in. mill run product is fully as valuable for this purpose as the specially prepared material or burnt lime. We may conclude therefore that the ¼-in. mill run product is ground fine enough for addition to acid soils.

As a result of four years work on the Newton field there is no evidence that finely ground limestone is more effective in correcting soil acidity than is the total product from a ¼-in. screen which contains both the finer material for immediate use and the coarser material for greater durability. This "mill run" product seems to be the most economical form to use.

Production in Nova Scotia and in Quebec

PRODUCTION of rock products in Nova Scotia and Quebec provinces for 1917 and 1918 were as follows:

NOVA SCOTIA

	Tons (2,000 Lbs.) 1918	1917
Limestone	407,048	411,575
Gypsum—crude	56,816	298,108
Gypsum—calcined	5,100	10,000
Building stone	6,163	24,711

The decreases were due to scarcity of men and water transportation, coupled with a decrease in building in United States and Canada.

QUEBEC

	Value 1918	1917
Feldspar and kaolin	$24,103	$19,969
Cement	3,003,534	3,264,664
Granite	161,411	167,659
Lime	437,212	343,588
Limestone and marble	644,755	749,592
Sand	87,008	161,840
Sandstone	.....	7,475
Slate and flagstone	5,124	7,789

How the Commercial Fertilizer Interests Attack "Illinois System of Agriculture"

Theory and Homilies vs. Results—Not Keen for a System Which Uses Nature's Own Recipe for Permanent Soil Fertility

AGRICULTURAL EXPERTS in Illinois have perfected a system of agriculture becoming famous as the "Illinois System." The fundamentals of this system are described in ROCK PRODUCTS of March 12, page 37, and more at length on another page of this present issue. The system is briefly "Lime, Legumes and Phosphate." This system has made Illinois the premier agricultural state of the Union.

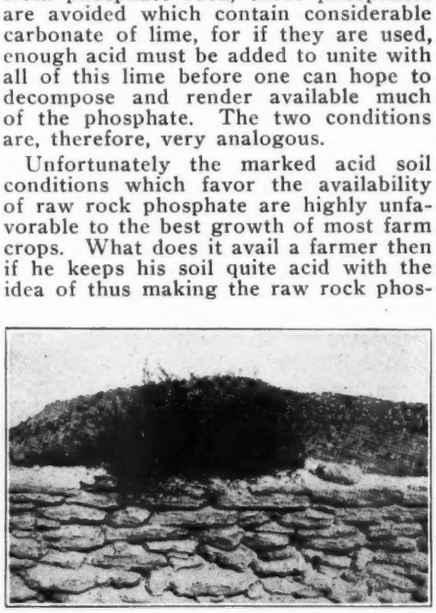
Notwithstanding results accomplished the Commercial Fertilizer Interests, like the old woman sweeping back the sea with her broom, continue to decry the use of raw rock phosphate, although they are compelled to acknowledge in some degree the virtues of lime. In the same manner the truth about rock phosphate will come out eventually. The following is typical of the criticism spread broadcast by the fertilizer interests (Dr. H. J. Wheeler) in a bulletin of the American Agricultural Chemical Co.:

Certain raw rock phosphate enthusiasts who first advocated the mixing of the phosphate with dung, in the hope of greatly increasing its availability, were extremely disappointed when the field experiments by Director Thorne of Ohio and the work by the Rhode Island and Wisconsin Agricultural Experiment Stations showed that the expected gain did not result. The failure to become available was due to the alkaline fermentation which takes place in the manures when they are stored in such a manner that the valuable ammonia is best conserved.

The next supposition was that in the field organic acids and nitric acid would develop to a sufficient extent to accomplish the desired object. It is very true that the ammonia formed in animal manures at the outset is eventually changed to a considerable extent into nitric acid, but what happens to it then? The advocates of the use of raw rock phosphate assumed that the phosphate rock had as little chance of remaining undissolved by these acid compounds as a doughnut would have of escaping a crowd of hungry schoolboys. If, however, the soil has been limed or contains naturally enough lime, magnesia, soda, and potash so that it is already alkaline or so nearly so as to be best adapted to the growth of most agricultural plants, the acids finally resulting from the fermentation of manures and other organic substances will unite with the lime and magnesia present in carbonates and associated with potash and soda in the highly decomposable soil silicates, before they can make any appreciable attack upon the far more resistant raw rock phosphate. The acids, therefore, act much like the man who will not climb to the top of the cherry tree for fruit as long as there are plenty of ripe cherries which can be reached from the ground.

Even in the making of superphosphate from phosphate rock, those phosphates are avoided which contain considerable carbonate of lime, for if they are used, enough acid must be added to unite with all of this lime before one can hope to decompose and render available much of the phosphate. The two conditions are, therefore, very analogous.

Unfortunately the marked acid soil conditions which favor the availability of raw rock phosphate are highly unfavorable to the best growth of most farm crops. What does it avail a farmer then if he keeps his soil quite acid with the idea of thus making the raw rock phosphate more available when such acidity actually prevents the production of profitable crops? To be sure some plants, like the cranberry and blueberry, can thrive best on a highly acid soil, but it would be folly for the farmer who is growing the usual crops to disregard the increase in yields which could be brought about by immediate liming.



Nature's testimonial of the value of limestone as a fertilizer—Alfalfa growing on a limestone wall

In this connection one is reminded that several years ago Deherain proposed the introduction of the raw rock phosphate into such acid soils long in advance of liming in order that the acids of the soil might have time to act upon it, but if the time for planting is at hand, delay in liming for a season, in order to accomplish this, would result in a far greater loss in the first crop than all the gain hoped for from the use of the raw rock phosphate. Delay in liming under such circumstances is analogous to "saving at the spigot and wasting at the bung" or like sacrificing a full course dinner for a prospective bit of dessert.

It is not only true that raw rock phosphate has far less value than otherwise when it is used on limed soil, but also that when the carbonate of lime and rock phosphate are already mixed most intimately, as they are in the so-called soft phosphates and marl phosphates, the probability that the phosphoric acid will be rendered practically available is even less.

It makes no difference whether the raw rock phosphate is supposed to be attacked by the soil acids or whether, as suggested by Gedroiz, it is supposed to be broken up because of the "absorptive properties" of soils deficient in bases, for in either case immediate liming is essential to economic crop production. After liming this acid action or absorptive property will largely or entirely cease as far as its effective attack on raw rock phosphate is concerned.

It was long ago shown by Stoklasa that bone is made more available by subjecting it to fermentation, but bone is a substance impregnated throughout with organic matter which is subject to decay. All that is necessary to be convinced of this fact is to treat a bone with hydrochloric acid. It will be found that the carbonate of lime and phosphate of lime can be entirely dissolved and nothing will remain but the organic matter which will still retain the form of the original bone. With inorganic raw phosphate rock the condition is entirely different.

In their recent excellent book on "Soils," Lyon, Fippin, and Buckman say:

> "It has been found, for instance, that calcium carbonate decreases the availability of raw rock phosphate and bone meal."

This is in accord with general experience, yet some advertisers and propagandists have endeavored to make the public believe that the raw rock phosphate has a high value as a source of phosphoric acid on limed soils, even when the lime and phosphate are applied in the same mixture. In this case science and practice coincide in showing that the claim of high value for raw rock phosphate, when used associated with carbonate of lime, is subject to serious question.

The results secured on an acid soil with an acid-enduring plant do not furnish a correct basis for estimating the economic value of raw rock phosphate for ordinary crops on limed soil.

Unlike raw phosphate, superphosphate (acid phosphate) is rendered far more effective in its action as a result of liming. On this account it is possible to secure the highest yields and greatest economic returns by liming and using complete fertilizers in which the phosphoric acid is present as superphosphate. Liming not only increases the efficiency of the superphosphate but also of much of the ammonia and, in some cases, even of the potash of fertilizers, whereas it lessens the efficiency of the raw rock phosphate. In a word, the proper course for the farmer is to lime sufficiently at the outset to adapt the soil to the plants which are to be grown, and then to use fertilizers which will have a greater rather than an inferior value under such conditions.

Phosphate Rock Field Reviewed

Summary of Conditions Last Month by W. C. Phalen of the U. S. Bureau of Mines

IN THE MT. PLEASANT, TENN., field, during April there was a disposition on the part of certain buyers to hold off with the expectation of a decline in prices. It seems impossible that the decline will materialize, unless there is an unexpected reduction in the cost of labor, coal, etc. During the month there were sales as high as $9, and the lowest quotation offered on 75 per cent rock was $8.50, with a premium and deduction of 25 cents per unit. These prices were for washed material.

Ground rock containing 12 to 14 per cent phosphorus, that is 60 to 70 per cent B. P. L., was offered at $7.25 to $9.00 per ton, of 2,000 lbs., in bulk. A 68 per cent lump rock has recently been put on the market at prices ranging from $6 to $7 per long ton.

Florida land pebble containing 68 per cent bone phosphate, f. o. b. Tampa, Fla., was about $5 per ton; with 75 per cent bone phosphate the price was $7.50 to $8 per ton; high-grade Florida hard rock containing 77 per cent bone phosphate, f. o. b. Florida ports, was $9 to $9.50 per ton.

General Conditions

Mt. Pleasant, Tenn.—While railroad statistics are not at hand, the activity in this field and the inquiry for unsold rock indicate that the requirements of phosphate rock for the manufacture of fertilizer, acid phosphate, etc., have considerably increased since last fall; and the general impression is that with a reduction in the price of sulphuric acid there will be a large demand.

During the month of April, there were local announcements of two new phosphate enterprises, namely, The Tennessee Agricultural Chemical Co., which has taken over the operations of the old Volunteer Phosphate Co., near Centerville; and the Columbia Chemical Co., which has purchased a tract of about 80 acres of land on the Pulaski pike near Columbia. Reports are that the latter company is just beginning to construct a 3-mile railroad connection to the L. & N. line, and proposes to erect plants immediately. The company at Centerville now has one grinding mill in operation, purchased with the property, and is planning to add two more.

The Armour Fertilizer Works has recently completed and started to operate an extensive washer plant on its McKennon property in the Century field. The Ruhm Phosphate Mining Co. has just completed the rebuilding of both its washer and grinder plants, and in so doing has doubled its former output capacity.

Ground Phosphate Rock

All of the ground rock available up to the middle of April was shipped as rapidly as it could be produced and loaded. The usual dull season then set in. This will, no doubt, continue until about July 15, or until after the Illinois harvest. In the meantime grinding continues, and the material is being stored for the fall season, since most buyers desire their shipments for direct applications between July 15 and November 1.

This condition makes it impossible to fill all ground rock requirements, as the shipping season always finds a more or less serious car shortage, and an inability to handle even from storage the amount that could be sold. Efforts are being made to remedy this situation in Illinois by the establishment, by agricultural associations, of storage facilities in different communities, and by shipping to these throughout the year, the material to be removed by the farmers when they are in a position to use it. If this arrangement can be effected it should mean an increase in the demand for ground rock for direct application to the soil. At present the production and shipping facilities are insufficient to fill all requirements, and there is little or no chance to attempt even the introduction of raw ground rock into new fields.

Labor is more plentiful than during the past year, but there has been no reduction in wages from those paid during the war. Just at present, between seasons, the demand for rock is being supplied, and material is being stored for later consumption, but it is doubtful whether labor conditions will be such as to insure a sufficient supply to be stored to meet the summer and fall demand.

The Industry in Florida

In the Florida phosphate industry, one of the factors of first importance is the shipping situation. The export business showed a marked increase during April, as compared with March, but it is still comparatively quiet as few bottoms are available, and the price for these is high. The export business is continuous generally throughout the year, and is not seasonal. It is, moreover, usually carried on in raw rock, which is stocked abroad and converted into acid phosphate as it is needed. This year more than usual acid phosphate is going abroad, because Europe has not had time to manufacture her normal requirements, owing to the war. A big demand for export rock is anticipated after the peace treaty is signed, as the soils of Europe are badly in need of this fertilizer material.

Indications are that the output from Tunisian and Algerian phosphate mines in North Africa is closely sold up, and that there will be an excellent demand for Florida phosphate as soon as vessels can be secured at reasonable freight rates.

Hard rock went principally to Norway and Sweden; land pebble chiefly to Netherlands; superphosphate principally to Denmark, Norway, and Cuba, "all other" to Denmark, Sweden, and Cuba. The March exportation was about three times what it was during February. Though normally the exportation is in raw rock, conditions in Europe are such that the acid phosphate, ready for immediate use, is in considerable demand, as consumers feel that no time should be lost in applying fertilizer to the impoverished soil.

Quarrying Oil Shale—Possible Oil Recovery from Given Acreage

FOR THE PURPOSE of arriving at the possible recovery of oil from a given body of shale the following figures may be taken: It takes about 18 cu. ft. of shale to weigh a ton. The workable shales of Colorado will easily show an average of 40 gal. per ton. Some tests run as high as 100 gal. or the equivalent of over two barrels of oil to each ton of shale. To be conservative and for the purpose of simplifying calculations, one barrel of oil of 42 gal. may be taken as a reasonable estimate of oil recovery.

These are 43,560 sq. ft. in an acre. If a shale ledge is not over 10 ft. thick there are approximately 25,000 barrels of oil to the acre. In many localities the ledges of paper shale will run 30 to 40 ft. thick with unknown bodies of leaner shales below. Recent engineers' report on some of the lands in the vicinity of De Beque place the possible oil recovery at 86,000 barrels per acre.

In northwestern Colorado and northeastern Utah the oil shale deposits underlie an area of approximately 5,500 square miles. In Colorado they occur chiefly in Garfield, Rio Blanco, Mesa and Moffat counties, and cover 2,500 square miles. The towns of Grand Valley and De Beque, on the lines of the Denver & Rio Grande and Colorado Midland railroads, are the points of entrance.

Screening Practice in the Industries

Different Screen Perforations and Their Particular Uses and Advantages

By Bruce G. Shotton
Hendrick Manufacturing Co.,
Carbondale, Penn.

IN EVERY MODERN INDUSTRY which involves separating and sizing of materials the use of a satisfactory screen is of the utmost importance. For such purposes perforated metals are becoming increasingly popular owing to their many advantages, such as strength long life, and uniform size of holes.

Before attempting to describe the use of perforated metals in different industrial fields a few brief words telling how metals are perforated might be of interest; but the modern multiple punch press with which the work is done is too complicated in its mechanism to allow a full description to be given here. Such has been the improvement in the construction of these machines during the past twenty-five years that where it was formerly possible to perforate but a few holes at a time (and these holes were limited as to size and shape), it is now possible and practicable to perforate hundreds of holes and of every desired shape or form. Sheets of metal can be perforated with tapered areas, with blanks and margins as desired and all with a degree of precision sufficient to meet all practical requirements.

Various Perforations in Use

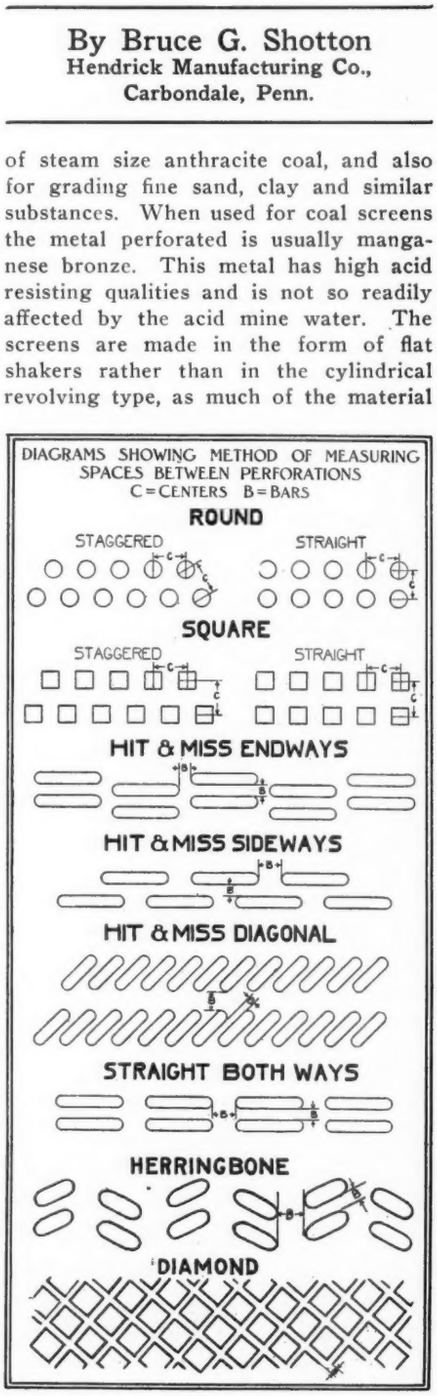
The different shapes of perforations commonly used are round, square, oblong, tapered and diamond and each has its distinct and separate merits. While some industries use but one or two shapes of perforations, experiments will in many cases show that greater efficiency can be obtained by using some other shape or mesh.

Round holes are more largely employed than any other shape of perforation. This is due to the fact that the holes may be set close together in staggered rows and still have a sufficiently strong wearing bar between perforations, thus insuring long life of screen and large screening area.

Round holes give especially good results where the product to be screened is broken in cubical form, and hence round holes are practically the standard form of perforation used by the two largest industries using screens, namely, the coal mines and crushed stone producers.

Some Coal Screening Experience

Very fine mesh screens having perforations from 1/32-in. to 3/32-in. in diameter are used for the final separation of steam size anthracite coal, and also for grading fine sand, clay and similar substances. When used for coal screens the metal perforated is usually manganese bronze. This metal has high acid resisting qualities and is not so readily affected by the acid mine water. The screens are made in the form of flat shakers rather than in the cylindrical revolving type, as much of the material is wet and experience has proven that shaker screens do not clog as readily as revolving ones.



Small holes of 7/64-in. diameter are the maximum size over which coarse sand is graded, while holes of ⅛-in., 5/32-in. and 3/16-in. diameter are used for sizing fine coal, screening clay and an almost endless variety of other materials. Holes of ¼-in. diameter are standard for separating coarse sand from gravel and are also used for sizing fine coal and other substances. Small gravel is screened through ⅜-in. diameter holes and over ¼-in. ones.

Holes from ⅜-in. to 8-in. diameter are used for sizing stone, coal, ores, slag and all other kinds of materials, the diameter depending upon the size product required.

Square Perforations

Square holes find favor with many anthracite coal producers and are also used extensively in coke screens. In screening coke and other materials of an abrasive character perforated metal has one great advantage in that the bar between holes can be increased in the direction over which the material passes thus giving longer life to the screens without reducing the screening area to any appreciable extent.

Square holes of ¾-in. or less are punched in staggered rows. This gives a fast screen as the dead space due to bars may be regarded as eliminated provided the screen is of sufficient size to prevent its being over-crowded with material.

Square holes are punched from ⅛-in. square to 6-in. square. Screens using this shape perforation are usually revolving ones though they are also often used in shaker screens.

Other Square-Corner Perforations

Oblong holes are punched in five different forms of mesh or stagger. These are called hit-and-miss sideways or side stagger, hit-and-miss endways or end stagger, straight both ways, diagonal and double diagonal or herringbone.

Side stagger perforations are used largely for locomotive spark arrestor screens but they are also used for screens for fine clay, sand, emery and similar materials. Screens with large size slots such as ½x4¼-in. side stagger perforations are employed for screening crushed limestone. They have good wearing qualities and give satisfaction when so used.

End stagger perforations are used for screening sand, clay, coal, and coke. When used as screens for the latter two materials they generally have large slots and are used in lip screens in chutes. End stagger screens are fast and the bar

between the ends of slots makes them strong and durable. The very fine meshes are made with slots ½-in. long but above 1/16-in. in width the slots are made longer.

Diagonal and Herringbone Perforations

Diagonal mesh is used mostly for screening cement and fine ores. Screens for cement are of the revolving type and tapered or cone-shaped. This style of mesh gives very uniform sizing, has a good screening area; and the peculiar relative position of the slots to one another leaves an especially strong bar where the wear is the greatest. Hence such screens give long continuous service. The very fine slots are called needle slots. They are usually ½-in. long and are made as narrow as 12/1000-in. Screens made with these fine slots are used in concentration mills for separating gold, silver, lead, iron and other ores. They are also used in separating very fine coal and might be used to good advantage in grading very fine sand or agricultural limestone dust.

Herring-bone mesh when made with small narrow slots is used chiefly for screens and strainer plates in chemical works, dye plants and similar industries. Large size slots might be used with good results in revolving screens for crushed stone, coke, and ore. Such screens would have good wearing qualities and would not allow material of the desired screen size to clog the screen if it were slightly irregular in shape.

Tapered Slot Perforations

Tapered slot perforations are a distinct and separate type. They combine all the advantages of round and oblong holes besides possessing the important quality of not clogging. They are generally used in what is known as flanged lip screens, that is, the perforated plate has a bent step or riser running across the large end of the perforation. One-half the diameter of the slot extends beyond the bend into the flat portion of the next step.

This is the feature which makes screens of this type self-cleaning and non-cloggable.

As a sizing screen for coal and coke these screens are becoming increasingly popular. Fixed screens made with this type of perforations are set on an angle varying from 15 degrees to 45 degrees depending upon the nature and volume of material passing over them. They are also used extensively in shaker screens where they give 50 per cent more production than a flat plate with round perforations. Sand screens have been made with this type of perforations and give excellent results. Because of their large capacity and uniform sizing qualities screens of this class will probably be found to be well adapted for screening and sizing broken stone.

Diamond shape perforations are sometimes used in screens for crushed stone but they do not possess any distinct advantages over square perforations and hence are not used to any great extent.

Screening is a problem which merits the most careful consideration. The value of any product, whether it be sand, stone, coal or any other material is enhanced by proper screening. Conditions vary with every kind of material and perforations which give the best results with some are in no way suited for screening others.

Frank M. Welch, in his carefully prepared articles in ROCK PRODUCTS in 1917 on the need of a standard of sizes for sand and gravel has shown the value of a consideration of the screening problems.

Domestic Production of Potash in the Year of 1918

STATISTICS of the production of potash in the United States in 1918, which are complete except for reports from some of the smaller producers, show a large increase of output. The returns now at hand indicate a total production of 192,587 short tons of potash materials containing 52,135 short tons of actual potash (K_2O). They are summarized in the adjoining tables, compiled by W. B. Hicks of the United States Geological Survey, Department of the Interior.

POTASH PRODUCED IN THE UNITED STATES IN 1918, CLASSIFIED ACCORDING TO SOURCES

Sources	Number of producers	Total production (tons)	Available potash (K_2O) (tons)
Natural brines	21	147,125	39,255
Alunite	4	6,073	2,619
Dust from cement mills	9	11,739	1,429
Kelp	6	14,456	4,292
Molasses distillery waste	4	9,505	3,322
Steffens waste water	5	2,818	761
Wood ashes	26	609	365
Other sources	3	262	92
	78	192,587	52,135

POTASH PRODUCED IN THE UNITED STATES IN 1918, CLASSIFIED ACCORDING TO PRODUCT MARKETED

Product marketed	Total production (tons)	Available potash (K_2O) (tons)
Muriate	30,127	12,614
Low-grade chloride	6,559	894
Sulphate	6,672	3,188
Crude sulphate and carbonate	122,741	31,311
Crude carbonate and caustic	609	365
Potash char, ash, and ground kelp	14,630	2,896
Cement and blast furnace dust, alum, raw and calcined alunite	11,249	867
	192,587	52,135

The production in 1918 was almost double that in 1917. About 75 per cent of the total output came from natural brines, 55 per cent coming from brines in Nebraska alone. Most of the product was in the form of mixed salts and fertilizer materials containing from 20 to 30 per cent of potash (K_2O). About 24 per cent of it was in the form of muriate and about 6 per cent in the form of sulphate.

For several years immediately before the European war the United States used annually an average of about 240,000 short tons of actual potash (K_2O). The production so far reported in 1918 is therefore about 22 per cent of our normal consumption. The imports during 1918 were very small. The producers reported that on January 1, 1919, they had in storage 60,426 tons of crude potash, held because of the dull market prevailing during the later part of 1918.

The Minimum Figures

These figures represent a minimum, as some producers did not give quantities, but stated they had produced considerably in excess of sales. Most of the potash now held in storage was produced when the price was high, when quantity production was the main object, and when competition with foreign potash was not considered. The price now offered for that material is apparently below the actual cost at which many firms produced it, consequently there is a crisis in the domestic potash industry. Many producing plants have already shut down and others are marking time.

The producing capacity of American potash plants, classified according to sources of raw materials, is estimated roughly as follows:

CAPACITY OF AMERICAN POTASH PLANTS

Source	Available potash (K_2O) (tons)
Natural brines:	
Nebraska lakes	50,000
Other sources	28,000
Alunite	4,000
Dust from cement mills	3,500
Kelp	5,500
Molasses distillery waste	4,000
Steffens waste water	3,000
Wood ashes	1,000
Other sources	1,000
	100,000

This quantity corresponds to more than 40 per cent of our normal consumption and indicates what may be produced in the United States during 1919 provided the American producers are able to compete with the foreign producers.

Canadian Magnesite Industry

Uses of Magnesite in Steel Production—Manufacture of Furnace Lining—Magnesite Bricks

MAGNESITE IS NOW LARGELY EMPLOYED for high-grade refractories owing to the development of the basic process in steel production. In this process, the refining of the metal is effected in presence of a highly basic slag, or one rich in lime; the result being to eliminate not only carbon, silica, and manganese, from the cast-iron, but also phosphorus, which cannot be removed in the presence of an acid slag, or one having an excess of silica.

Magnesite Offers Complete Resistance

Bricks made of silica or fireclay are unsuitable for furnace linings where basic slags are used, as these materials soften too easily in contact with lime. Magnesite bricks, on the contrary, being themselves basic in composition, offer complete resistance. In all basic furnaces, the sole and lower part of the vertical walls is built of magnesite, the arch being always constructed of silica brick.

The direct contact of magnesium and silica brick will provoke mutual fusion, so that ferro-chromium brick, which act neither on silica nor magnesia, are used to separate them.

A good deal of the Quebec magnesite from Grenville township is used for furnace bottoms, without being made up into brick shape, the method of using it, being as follows:

The magnesite is first calcined in the manner in which limestone is burned to produce lime. This calcined material is broken into small pieces of one-half inch or less in size, and is mixed with crushed basic open-hearth slag in varying proportions. The furnace to be lined is then brought up to a temperature of 2,700 to 2,800 degrees Fahr., and the mixture of magnesite and slag is thrown in on the bottom of the furnace, in small doses, care being taken to distribute the material evenly, the bottom being built up in successive layers, as the mixture becomes sintered, until the required thickness is completed.

Definition of Dead Burned

When magnesite is burned to a high temperature so that it shows no shrinkage in further heating and does not crumble on exposure to air it is said to be dead burned.

Dead burned magnesite is produced by the Scottish-Canadian Magnesite Co., in the plant of the Canada Cement Co., at Hull, Que. In this process, the magnesite, as it comes from mines in Grenville township, is mixed with 6 per cent of iron ore from the Forsyth iron mine at Ironsides. The mixture is passed through a jaw crusher and ball mill, until reduced to pass a 100-mesh screen.

The ground mixture of raw magnesite and iron ore is fed to one of the rotary kilns ordinarily used for burning cement, and fired at a temperature of probably 2,800 degrees Fahr., the fuel used being powdered coal, blown into the kiln under air pressure. It requires about one hour for the material to travel through the kiln, which is 60 ft. long. The burned product is a dense, hard, granular material, of dark brown colour, and about the size of fine gravel. This product is known as grain magnesite, and is supplied to steel manufacturers for lining the bottom and sides of forging, heating, and welding furnaces.

Reason for Adding Iron Ore

The iron ore is added for the purpose of sintering the magnesite into a dense hard material, as it would be extremely difficult to dead burn the magnesite unless the iron was present to act as a flux or binder. The finely divided state in which the raw magnesite enters the kiln also facilitates the burning, as it certainly would not become dead burned at 2,800 degrees if put through in lump form.

The following chemical analyses show the changes that occur in the raw magnesite when converted to the dead burned condition:—

	A	B
Silica	2.60	6.3
Alumina	1.40	1.9
Iron	0.34	6.4
Lime	9.78	16.5
Magnesite	35.80	69.0
Carbon dioxide	47.10	—
Water	0.83	—

A. Average sample of raw magnesite from Grenville township, Argenteuil county, Que. Analyst, R. T. Elworthy, Mines Branch.

B. Dead burned magnesite from Hull, Que. (6 per cent of iron ore added to raw material before burning). Analyst, S. G. McAnally.

A sample of the dead burned magnesite of composition B was submitted to heat treatment in a carbon resistance electric furnace heated up to the softening point of cone 34 (1,810 deg. C.) The material was not affected at this temperature, and it withstood the effect of the heat as well as a brick made from Austrian magnesite, upon which it was supported.

Practice Began in 1917

The practice of dead burning magnesite began in the Hull cement plant in October, 1917, using one rotary kiln, and producing about 35 tons of grain magnesite per day. The demand for this product had increased to such an extent that three kilns were in operation by May, 1918, producing about 100 tons per day.

Magnesite Brick

Several patents have been taken out with the object of making magnesite brick from raw magnesite in one operation of burning, by adding chrome iron ore as the sintering material in amounts up to 30 per cent. Some test pieces of the above mixture were prepared by the writer, and burned at cone 25. The results of this test showed, that the shrinkage in the burned bricklets was so great, that the operation could not be regarded as being within the range of practical brickmaking. Moreover, the bricklets air slaked and crumbled within two months after being burned. The crumbled material made up into bricklets and burned the second time, also disintegrated some time after reburning.

Several other sintering materials, such as serpentine, iron ore, and kaolin, in amounts of 5 to 10 per cent, were tried, but without success. A mixture containing 90 per cent of raw magnesite ground to pass a 10-mesh screen, 5 per cent of iron ore, and 5 per cent of kaolin, gave the best results, as it did not air slake and crumble after burning, but the shrinkage was abnormal.

It appears certain that two burning operations are imperative in the manufacture of magnesite brick. The first burning may only be carried to the calcining temperature so as to drive off most of the carbon dioxide. This operation also takes a large part of the shrinkage out of the material.

If dead burned magnesite is used for brickmaking it is usual to add 15 per cent of light calcined magnesite with 85 per cent dead burned. This mixture is thoroughly milled in wet pans, moulded by hand into brick shapes, and when partly dry, are re-pressed by machinery.

In order to develop a bond and produce a strong hard brick, the burning must be carried to a very high temperature, usually from 1,500 to 1,700 degrees centigrade; or from cone 20 to cone 30, according to the composition of the material.

Using Raw Magnesite

If raw magnesite is used for brickmaking, the operation consists in mixing about 10 per cent of iron ore with crushed raw magnesite, and milling the mixture in wet pans. The mixture is made into brick shapes by hand, and burned in kilns at the calcining temperature, or about 1,000 deg. C. The calcined bricks are broken down and milled a second time in wet pans, and pressed into brick shapes by machinery. These are set in kilns when dry, and burned to the necessary high temperature.

Previous to the year 1915, the United States relied almost entirely upon the supply of Styrian magnesite, which was

imported largely in the calcined state. Since then, the hitherto unworked magnesite deposits in California and Washington have been drawn upon for use in the steel industry. Brickmakers in Britain imported both Styrian and Greek magnesite before the war, but since then magnesite brick are made of magnesite from the Indian and Greek deposits.

The following chemical analysis gives the composition of the various bricks:

	1.	2.	3.	4.
Silica	1.85	7.38	7.0	6.82
Alumina	2.47	1.36		1.28
Iron	5.95	7.72		7.0 1.88
Lime	3.45	7.85	1.0	3.78
Magnesia	85.40	73.80	85.0	83.50
Alkalis	0.31	....	....	0.34
Loss on ignition	0.66	1.89	....	2.48

1. American made brick in 1914. Analyst, R. T. Elworthy.
2. American made brick in 1917. Analyst S. G. McAnally.
3. American made brick in 1918.
4. British made brick in 1917. Analyst, R. T. Elworthy.

Greek magnesite has usually more silica and lime, but much less ferric oxide than Styrian magnesite. Canadian magnesite is irregular in composition, but usually carries more lime and less iron than the European materials. The Washington magnesite is similar in composition to the Canadian occurrences.

Other Experiments

Some experiments in brickmaking were made in the laboratories of the Mines Branch on the grain magnesite produced at Hull. This material is very hard, so that when it is crushed and screened to the size of grain ordinarily used for brickmaking, it is found to be very gritty, and when wetted has no coherence, so that it would be impossible to press such a material alone, either by hand or by machinery. It is necessary, therefore, to add a bonding material which will enable the brick to be handled without damage as it comes from the presses.

Lightly calcined magnesite which has a pasty consistency when wet is usually employed in amounts varying from 6 to 15 per cent. When this mixture is thoroughly milled in wet pans it has sufficient coherence for moulding, and can be made into brick shapes.

If the dead burned magnesite is ground very fine, so that there is considerable dust in the ground product, it is possible to mould it in a damp state without a bond in presses similar to those used for making dry-pressed building bricks.

The best results were obtained by grinding the material so that it all passed a 16-mesh screen with 45 per cent passing through a 100-mesh. When ground to this texture the magnesite simply requires to be slightly moistened to prepare it for pressing. After being pressed and dried the bricklets harden so that they can be readily handled for setting in the kiln. The shrinkage after burning to cone 25 (1,630 degrees C.) was 2 per cent.

If the magnesite is ground very fine, so that it all passes through a 100-mesh screen, fire checks are liable to develop in the burned brick, and the shrinkage will be higher.

Spalling of Magnesite Brick

One of the chief defects of magnesite brick is failure from spalling and disintegrating in use under repeated heating and cooling. The disintegration is very much hastened in the presence of the action of steam, even on thoroughly burned brick made with magnesite very low in lime or other impurities. In making some experiments on magnesite brick for the Royal Mint the writer found that all the trial pieces made up with the ground Canadian dead burned magnesite bonded with light calcined magnesite, were subject to spalling when set in the furnaces at the Mint. Brick made from Styrian magnesite behaved no better in this respect. When the Canadian dead burned magnesite was bonded with 5 or 6 per cent of china-clay, however, neither spalling or disintegration occurred during prolonged trial in place in the furnace.

The brick made with 12 per cent china-clay as bonding material, and burned to cone 25, were very dense and strong, with a flinty fracture, but they have a tendency to deform if burned to a higher temperature than this. When the magnesite is ground to pass a 12-mesh screen, bonded with 6 per cent of china-clay, and burned at cone 25, a much stronger brick is obtained than when calcined magnesite is used. Furthermore, it has the advantage of not being so liable to spalling and disintegration. The objection, however, to the use of clay as the bonding material is, that it increases the silica content of the brick, so that it may not be able to withstand the corrosive action of basic slags, or the great heat in the roofs of electric furnaces.

The following chemical analysis shows the approximate composition of the grain magnesite from Hull when bonded with 6 per cent of kaolin.

Silica	10.52
Alumina	4.18
Iron	6.00
Lime	14.5
Magnesia	64.18

Wants to Develop Arizona Marble Deposit

L. R. LIGIER, Dragoon, Ariz., writes that he has near that locality a remarkable marble deposit, which contains both white and colored material. He writes that he can duplicate from this deposit nearly all the imported decorative marbles. The deposit is within two miles of the Southern Pacific Railway main line already accessible by a good wagon road. Mr. Ligier is seeking capital to develop this deposit.

Manufacture of Cement in the Chinese Empire

WASHINGTON, D. C.—The Department of Commerce, through its commercial attache at Peking, has completed a survey of Chinese products of interest to Americans, among them being cement produced and exported.

China is favored with excellent limestone deposits in the north and southwest, together with gypsum and other essentials to good cement. Cements of excellent quality are now being produced, and the industry is rapidly growing in importance in the export trade.

This business now amounts to about 80,000 tons a year, including 25,000 tons shipped abroad, with Tientsin, Chinwangtao, Dairen and Kowloon the principal ports of export in the order named. The Green Island Cement Co. at Hongkong, the pioneer in the field, has a plant capitalized at $3,000,000 Mexican gold. French Indo-China also produces considerable cement of good quality.

A few years ago Japan produced annually 4,000,000 barrels, and it was then anticipated that by 1918 its production would be nearly doubled.

Cement Imports for 1918 Show Decrease

WASHINGTON, D. C.—Imports of cement during the year 1918 reached a lower level than for several years, according to statistics from the Department of Commerce. Total imports during the year amounted to $14,408, of which $1,185 covered 114,600 pounds of hydraulic, and $13,123 covered other cements. During the year 1917, total imports of $37,475 covered 882,900 pounds of hydraulic cement, valued at $6,075, and other cement to the value of $31,400.

Imports of unground flint stone also decreased during the year, the total amounting to but $127,808, as compared with $195,977 in 1917, and $313,120 in 1916.

Tests of Jersey County, Ill., Limestone

ST. LOUIS, MO.—Enough limestone can be found in Jersey County, Ill., to supply the entire state for farm purposes, according to C. E. Wheelock, the county farm advisor. Recent tests have been made of the limestone found in Jersey County: that in the vicinity of Grafton, Ill., tested 100 per cent, Mr. Wheelock said. Ninety-eight per cent rock was found near the old lime kiln in English Township. Several private crushers have been purchased and farmers are now grinding their own rock for fertilizing purposes.

Why Houston Opposes Federal Highway Commission

Declares Abolishment of Present Plan Would Cause Complicatons, Expense and Delay—Says It Is Working Fine

WASHINGTON, D. C.—Secretary Houston, in response to a communication from a city Chamber of Commerce requesting his views regarding the creation of a Federal Highway Commission and the wisdom of taking the Federal supervision of highways from the Department of Agriculture and placing it under such a commission, said:

"I have been unable to see the need for the creation of a separate Federal Highway Commission or the wisdom of substituting for the present cooperative program a plan which would commit or limit the Federal Government to the construction of two Federally owned and maintained trunk lines in each State.

"It is a part of the (Federal-Aid) plan to have an advisory committee, composed of representatives of the State Highway Departments, selected by the American Association of State Highway Officials.

"It seems scarcely likely, in view of the fact that nearly $300,000,000 are now available out of the Federal Treasury, that Congress, in the light of the financial situation, will make additional large appropriations; and it would be impossible, without creating many complications, to divert the existing appropriations from the purposes and plans already under way under the cooperative arrangements with the states. A considerable part of the available appropriations has already been formally tied up under agreements with State departments and contracts for large sums have been let. Additional large amounts are being pledged monthly. Every State has accepted the Federal Act and many of them have by law directed its agencies to cooperate with the Secretary of Agriculture. These State laws and arrangements cannot easily be changed and perhaps would not be. It seems to me that, instead of asking for more or different legislation, we should now proceed actively and vigorously with the construction of roads under existing arrangements.

"I am convinced that nothing material would be gained by the proposed change. The creation of a Commission would entail unnecessary additional administrative expenditures and the Commission could not do anything that cannot now be done more effectively by the existing cooperative machinery. There would also be a radical change of policy.

"The road construction movement is growing very rapidly. The Federal Aid Road Act has done much to promote it. Comprehensive road programs have been inaugurated. They are being pushed vigorously. They will result, in a shorter time than most people imagine, not only in a network of good substantial roads in the various States of the Union, but also in the requisite interstate roads.

State Representatives to Advise in Federal Aid Highway Work

Committee Named to Bring Closest Cooperation in Great Program; Action Follows Request of Secretary of Agriculture

WASHINGTON, D. C.—To bring about the most effective cooperation between the Federal and State Governments in the big program of highway construction now under way, A. R. Hirst, president of the American Association of State Highway Officials, has named, at the request of the Secretary of Agriculture, a committee to act with the Department of Agriculture's Bureau of Public Roads in carrying into effect the Federal Aid Road Act and its amendments.

Following are the State representatives selected by Mr. Hirst:

George P. Coleman, State highway commissioner of Virginia; S. E. Bradt, State superintendent of highways of Illinois; Charles J. Bennett, State highway commissioner of Connecticut; W. S. Keller, State highway engineer of Alabama; and Ira R. Browning, State road engineer of Utah.

Stimulated by recent liberal amendments and added appropriations to the original Federal Aid Road Act, road-building plans in the States have received tremendous impetus. Many of the states have provided, by large bond issues and otherwise, amounts much larger than will be required to match the Federal apropriations.

The amount of Federal aid funds available on March 1 for road building was more than $72,900,000, which, under the law must be matched by an equal amount from the states, making a total of $145,800,000, which includes approximately $9,800,000 from Federal and States sources for roads in the National Forests. Funds that will become available on July 1, with equal contributions from the States, will provide an additional $198,000,000 for Federal aid road work, making an aggregate sum of $343,800,000 available for the calendar year. It is expected, however, that the States will defer taking up part of the available funds until 1920.

War condition, which almost immediately followed the passage of the first Federal aid act in July, 1916, brought scarcity of labor, materials and transportation, and restricted road-building projects to those absolutely essential to winning the war. Thus the road program was held back for more than a year at a time when demands for improved roads increased more rapidly than in any previous period. State and Federal forces alike are working to get highway construction under way as rapidly as contracts can be let and as soon as road-building forces, somewhat disorganized during the war period, can again be placed on an efficient working basis.

Chance for a Building Supply Association Secretary

AN ACTIVE BUILDING SUPPLY association in the East has asked Rock Products to help find it a high grade active secretary, who has had some experience in general secretarial work; of good address and personality; not over 45 years old; preferably single; experience in the building supply business not absolutely essential, but desirable. He should be a man capable of increasing the membership and directing the association's efforts in educational, publicity and general sales promotion. If you are such a man or know of one open for this position, adress J. L. D., care of the editor of Rock Products.

Effect of Cement Dust on Workers Investigated by United States

Not as Injurious as Generally Reported

WASHINGTON, D. C.—An exhaustive study of the diseases induced by the employment in workers engaged in the manufacture of cement is included in a report on the mortality from respiratory diseases in dusty trades which has just been made by the bureau of labor statistics of the Department of Labor.

"The health-injurious conditions of cement-making processes are quite well understood," declared the report, "being not only the dust, but also the noxious vapors which arise through the process of burning. The vapors are probably more a matter of discomfort than injurious, but the subject has attracted sufficient attention to suggest investigation, as a result of which cement works, as a rule, are now located outside of large cities."

The investigators found that the health conditions in American cement works have never been fully investigated, but that it appears to be the consensus of opinion that the effects are not as serious as assumed upon the facts of a casual inspection. Fatal accidents have occurred as the result of asphyxiation by carbon-monoxide gas, but such cases are very rare. Cases of gassing—so-called—which do not terminate fatally, are said to be comparatively common.

Dust Unavoidable

The amount of dust generated in cement-making processes is enormous. The workmen, it was found, take practically no precaution to avoid it, and considerable quantities are of necessity inhaled. It is very rare to find employes who use a respirator or even a piece of ordinary cloth to provide some protection against the health-injurious conditions which surround them. The worst conditions are probably in the sacking or packing department, where such precautions are occasionally adopted. Every department, however, is filled with dust, and the avoidance of inhalation by the majority of employes is under present methods practically impossible. The disease problem is complicated by a high degree of temperature in some of the departments, particularly at the kilns. While many descriptive accounts of the industry have been published, the hygiene of the occupation has been generally ignored.

The report contains a number of descriptions of the work by various writers and a comparison of the dust hazards in the dry and wet processes.

Despite the conditions under which they work, the spread of tuberculosis and other respiratory diseases has been very slight, and has been remarked upon by various investigators. "It would appear that the employment was not physically injurious to the extent of a loss in weight," said one writer, "but, rather, to the contrary, a gain resulted among the men exposed in the most dusty parts of the mill."

As a result of an investigation in one mill, the inquirers reported: "As a result of an investigation of the dust problem in conjunction with the manufacture of Portland cement, based upon the review of literature on the subject, the examination of 956 employes in one plant, examinations of men employed in the dusty departments of four other mills, the medical records of employes and guinea pig experimentation, there appears to be no evidence of injurious effects from cement dust upon employes engaged in its manufacture."

Drastic Regulations in Prospect

"The American cement industry has within recent years attained to such nationwide importance that the preceding considerations are applicable to a labor problem which at any time may assume serious significance," it is declared in the labor bureau's report, "as made evident by a proposed measure in California aimed at the regulation of the industry by exceedingly drastic methods, as regards the impervious packing of the product, not with reference to the men engaged strictly in cement-making processes but solely for the protection of men employed in the subsequent handling of the finished product which in course of transportation. This suggests future possibilities which make it exceedingly important that the facts concerning the injuriousness or noninjuriousness of cement dust should be ascertained with impartial and strictly scientific accuracy.

"Cement is produced in practically every state of the United States, although the principal centers of production are Pennsylvania, Indiana, New York, Illinois, California, Missouri, Michigan, Iowa, New Jersey and Kansas. These ten states in 1914 produced 82.6 per cent of the aggregate output and there are no reasons for believing that a material change occurred during more recent years.

"On account of the common occurrence of pulmonary tuberculosis under all labor or industrial conditions," concludes the report, "it is self-evident that no crude statistical analysis of this kind can precisely measure the health-injurious effects of any particular occupation, trade or industry. At best such data are only of approximate value, unless the incidence of pulmonary tuberculosis is so pronounced as to justify unqualified conclusions.

Less Dangerous Than Other Dusts

"In the case of cement dust it is apparently shown that the results, if serious at all, are much less so than in the case of most of the other trades considered. It is difficult to accept, without due reserve, the conclusions advanced by other investigators in their entirety, and particularly the statement that 'outside of the packing room and the sack-cleaning room there is no department in which cement dust escapes into the atmosphere in any appreciable quantities.' It may be stated with confidence that practically all branches or departments of cement manufacture involve considerable exposure to the dust hazard, and while the evidence may be wanting that cement dust is a predisposing cause of tuberculosis, there can be no question but that certain forms of respiratory affections are relatively common, at least among certain classes of employes."

The results of an English inquiry into the subject are quoted to show that the trade is on the whole a healthy one; that deaths are few; that absence from work is rare and generally due to influenza, colds, or accidents; and that there is often more invalidity among workers in nondusty processes than in the dusty occupations of kiln drawing, milling, and packing.

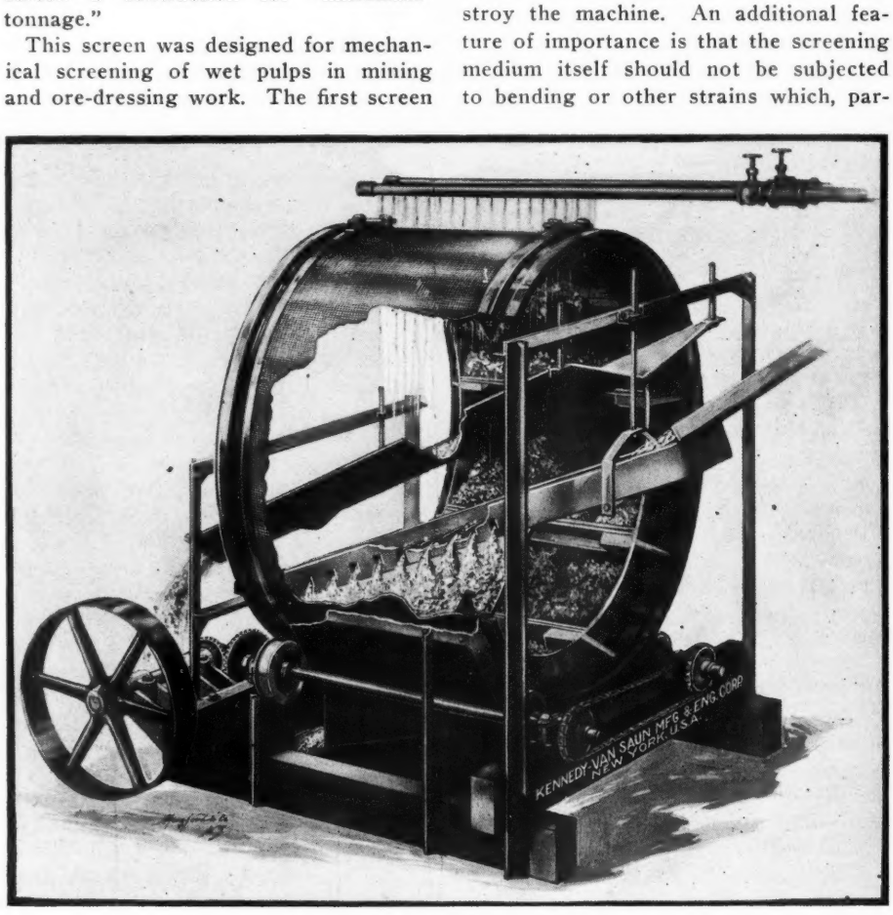
The general conclusion was that "while the dust is not of an injurious nature, probably owing to the fact that free silica is present in very small quantities, it does cause irritation and trouble in some cases, and is at least a nuisance, and efforts should be made to prevent and reduce the escape of dust wherever practicable." This view has the indorsement of a letter in the "British Medical Journal" for May 7, 1900, in which, following a reference to the conclusion that all dust is more or less seriously injurious to health, it is said that "a decided exception should be made in favor of lime dust." In the writer's personal experience "those breathing it habitually at limekilns are free from tuberculosis, and a similar observation has been made in France and Germany." Furthermore, it is said that "lime dust in abundant quantity, either by acting on the body or on the tubercle bacillus outside of the body, is antagonistic to tuberculosis."

NEW MACHINERY AND EQUIPMENT

New Sand Screen

THE Kennedy-Van Saun Manufacturing Co., New York City, has just placed on the market a new screen of the revolving cylindrical type which has a number of novel features. It is already being adopted to a considerable extent in the silica sand industry. The new screen is known as the "Maxton" screen—a contraction for "maximum-tonnage."

This screen was designed for mechanical screening of wet pulps in mining and ore-dressing work. The first screen was built and operated at a wet-crushing mill to overcome certain difficulties in existing screens and to embody certain principles the metallurgist in charge believed to be correct. In the beginning, it is stated, there was no thought of commercial development of the machine; it was designed and built solely to perform a definite service.



New wet-screening machine for fine material

Its success proved its adaptability for all wet screening processes, and has been used with satisfactory results for wet materials as fine as 80 or 100-mesh.

Principles Desirable

According to the manufacturer of this screen, the principles involved for satisfactory screen sizing are: (1) The delivery of a bed of feed pulp one particle thick to the screening medium; (2) the removal of oversize before the delivery of additional feed to the screening medium; (3) prevention of oversize sliding over the screen surface, and (4) the elimination of shaking or bumping devices which tend to blind the screen and destroy the machine. An additional feature of importance is that the screening medium itself should not be subjected to bending or other strains which, particularly with wire screens of the finer meshes, lead to early destruction.

The delivery of the single-particle bed prevents the oversize acting as a filter and retaining undersize particles.

The removal of oversize before adding more feed reduces to a minimum the tendency to block the screen apertures.

The prevention of sliding the oversize on the screen surface minimizes the wear on the screening medium.

The elimination of shaking, bumping or vibrating devices reduces wear on the screen surfaces and on the machine, reduces the tendency to blinding and consequently increases the possibility of maintaining the screen in a continuous condition of maximum efficiency.

All these principles, the manufacturer claims, are embodied in the new "Maxton" screen.

Screen Described

The screen is of the tubular type. It consists of a cylinder open at both ends, revolving horizontally upon two sets of rollers, like the tire-type tube mill. The body of the tube is the wire-cloth screening medium. It is supported by heads at each end and longitudinal ribs connecting the heads. Projecting radially from the inside of the tube are the lifters, or ribs. These run longitudinally between the heads and project a short distance into the tube.

The feed is delivered through a distributing trough along a line running the entire length of the tube near its lowest point. An incline apron provides for the delivery of the feed upon the screen without impact.

The undersize passes through the screen into a collecting pan. The oversize remains upon the screen surface. As the screen revolves, the travel of the oversize is limited by the ribs, which hold it and carry it up and, at a sufficient elevation, deliver it into the oversize trough or chute, which is above the feed-entry trough. A pair of water spray pipes, placed above the screen, assist in discharging the oversize material and serve to keep the screen openings entirely clear. Another spray pipe may be, optionally, placed under or alongside of the feed-entry trough to assist, if it should be necessary, in washing the oversize clear of adhering slime or colloid particles. The accompanying illustration shows the features of the screen.

The principal dimensions are: Diameter, 4 ft.; length of tube, 3 ft.; length over all, 6¾ ft.; width over all, 6 ft.; space required for installation, 6¾x6x5½ ft.; effective screening area, about 29 sq. ft. Life of screening medium, 150 to 250 per cent of that of the usual screening machine under the same circumstances. Capacity, from 50 tons up per 24 hours, according to conditions.

It is claimed that the machine has demonstrated, in actual practice, that it screens continuously with high efficiency; that its capacity is continuously relative to its screening area; and that it is admirably adapted to the production of fine sand and gravel in washing plants.

General News From The Rock Products Markets

Illinois Price Investigating Committee Reports

THE REPORT OF THE DAILEY JOINT LEGISLATIVE COMMITTEE of the Illinois Legislature that has been investigating the cost of production of building and construction materials needed in the post-war reconstruction period was made public May 7 and was presented May 8 to the general assembly.

The report finds there is no evidence of a combination of paving brick manufacturers. It finds indications that seem to point to a combination on prices between cement manufacturers, and recommends the establishment of a state plant to manufacture cement.

The committee reports that the record contains no evidence of "illegal agreements for the purpose of profiteering" in any business, subject to the observations made concerning cement prices.

Expect No Price Drop

The report, in its conclusions, says: "We are driven to the inevitable, logical conclusion that existing prices will not decline materially, and that these prices express a new and substantially permanent level upon which present and future business must be conducted.

"We believe it to be our duty as public officials to advice the public not to delay building projects in the hope prices will come down materially. We do not believe they will."

"All contemplated buildings, homes, and improvements should be started now. Reconstruction can only be accomplished in its real sense by every citizen subscribing to the doctrine 'Buy now, build now.'"

Would Build Own Roads

Legislative recommendation in the report included:

"State operation of roadbuilding material plants. The direct interest of the state in a comprehensive system of roadbuilding makes it imperative that the state should protect the public from extortionate charges for roadbuilding material. We believe the state should be authorized by law to manufacture products entering into the public improvements of the state."—The Chicago "Tribune."

Government to Give 20,000 Motor Trucks to the States

MORE THAN $45,000,000 worth of motor trucks are about to be distributed by the Secretary of Agriculture through the Bureau of Public Roads to the State highway departments. These trucks have been declared surplus by the War Department, and are being distributed to the States under the provisions of Section 7 of the Post Office Appropriation Bill. They must be used by the States on roads constructed in whole or in part by Federal aid, for which $200,000,000 in addition to the former appropriation was given to the States under the same bill. All that the States must do to acquire the use of these 20,000 trucks, which range in capacity from two to five tons, is to pay the loading and freight charges.

Of the 20,000 motor vehicles to be acquired practically free by the States, 11,000 are new and 9,000 are used, but all are declared to be in serviceable condition. The motors will be apportioned to States only upon request of the State highway departments on the basis of the requests received from the respective States, and in accordance with the apportionment provided in the Federal aid law approved in 1916. The requirements of the law are such that the Bureau of Public Roads can not distribute any trucks to counties or individuals.

Application of Freight Rate Reduction

NO ONE yet has been able to get a definite statement from the Railroad Administration as to how the 10 cents per ton reduction in freight rates on mineral aggregates for use in public roads will be applied. A telegram to E. Guy Sutton, secretary of the National Association of Sand and Gravel Producers, from the Railroad Administration, stated that: "The internal revenue requirements for the exemption of the war tax (on freight bills) will be the authority for reduced rates on road material."

For this purpose the Treasury Department requires only a certificate stating the purpose for which the material was or is to be used and the federal department or local government authority by whom the freight is paid. This is signed by the proper officer and attached to the waybill or bill of lading in lieu of the tax.

Evidently a road contractor may buy mineral aggregate and have it consigned to the local government unit, which is paying for the work, care of himself, and by having one of these certificates issued can get both the tax exemption and the 10 cents per ton reduction. These details, however, have not been authoritatively announced.

April Building Permits Show Big Gain

THAT BUILDING is getting under way is shown by the building permits for April. Official reports to the American Contractor from 149 cities of the United States give a total of $79,077,971 for the month as compared to a total of $41,028,999 from these same cities for April permits in 1918. These figures show a gain of 93 per cent over last year. March of this year showed only a 71 per cent gain over March, 1918; February showed a 48 per cent gain and January showed a 12 per cent loss.

It must be noted, however, that 1918 was an exceedingly dull year. The following table gives a comparison of the current April's figures with those of previous years.

April Permits

Year	No. Cities Reporting	No. of Permits	Estimated Value
1919	149	34,814	$79,077,791
1918	149	22,327	41,028,999
1917	121	29,823	86,100,925
1916	109	21,081	89,812,962
1915	109	29,385	77,056,478
1914	78	.....	65,531,427

The average value of April permits per city for the years 1914 to 1918, inclusive, is $671,970. The average value per city for April, 1919, is $530,724. By this comparison April of this year is 79 per cent normal. This comparison has as its weakness the fact that a city is not a fixed base to draw comparison from.

Cement Stave Silos Offer Field to Gravel Men

CEMENT STAVE SILOS are proving to be quite popular in Illinois and should offer to every producer of sand and gravel a large field for business, according to the Illinois Sand and Gravel Producers' Association Bulletin. The cement stave silo is always made in factories, and can be sold in dollar to dollar competition with wooden stave silos. At the present time there are factories of some size at Elgin, Freeport, Joliet, Peoria and Litchfield, and smaller plants at some other points throughout the state.

Building Material Price Movement Changes to Upward Tendency

Trend of Month Ago Reversed—Effort Now Is to Keep Prices From Soaring, Says Dow Service

NEW YORK—Building material manufacturers and dealers in New York find the situation regarding price movements here, as well as in several sections of the country, to have been almost entirely reversed within the last few weeks, according to The Dow Service Daily Building Reports.

Distributors reporting a 30 per cent increase in the volume of building materials leaving supply yards here in April over March deliveries; and almost two-thirds of the April gain reported for the first ten days of May, uncover a tendency to take advantage of the building shortage and rent crisis by boosting prices. This tendency exactly reverses the trend of the market scarcely a month ago when all efforts were being made to hold to a stabilized market against a threatened stampede to lower quotations on almost every commodity. Such a sharp turn about in building materials is unprecedented and in the absence of guide-posts of experience there has resulted a degree of unity of purpose that bodes much more favorably for the builder and construction interests, seeking to relieve the present housing shortage, than could have been expected if the flavor of wartime cooperation and singleness of purpose had not been nurtured for exactly the exigencies foreseen five months ago by the Dow Service Daily Building Reports.

There is no question but that the building movement is getting under way and with this fact growing more deep seated in the mind of building material manufacturer, distributor and assembler, there looms greater need almost hourly for strictly holding down to present price levels as long as possible. But there are individual and economic factors that within the last week have combined to force prices up on the argument that there is an abnormal demand and therefore there should be an abnormal price especially since the supply is abnormally low. It seems to be wholly conservative today to say that all basic and many supplemental building materials have reached their lowest level. This seems to be true of structural steel, common brick, sand, gravel, grit and crushed stone, Portland cement, asbestos and plaster, asphaltum lead and zinc, linseed oil and particularly lumber. Instead of it now being a question of how soon building material prices will drop, it has suddenly resolved itself into a question of how long can they be held at present levels.

Conditions have spurred the desire to make quick recovery on war time losses in certain quarters and the only agency that is successfully combating this tendency is the distributor and the far-sighted manufacturer working close together to keep the market within the grasp of the building investor who can proceed with his project with some hope of relieving the house shortage next winter.

The building pulse is being reflected by the movement for decorative interior materials. Various authorities have various views on price trends, particularly on foreign marbles. Current stocks are unquestionably low, but there are now on the ocean fine Italian and Belgian marbles, sufficient to keep the market well supplied, according to C. D. Jackson, of C. D. Jackson & Company, who say they are selling black and gold Italian marble as low as $6.70 for first, $6.00 for second and thirds for $5.50.

The conditions regarding price, supply and demand, here briefly referred to, are current in New England and in the central west.

Building Material Prices Will Not Drop This Year Says Report

Central Stabilization Committee of Washington, D. C., Says Present Level Is a Stable Basis

WASHINGTON, D. C.—No hope for lower construction prices during 1919 is held out in the report just made to the Commissioners of the District of Columbia by the central stabilization committee appointed April 18 to investigate the building situation in Washington, with a view to stabilizing construction.

The present level of prices, both of material and labor, represents a stable basis from which to figure construction work, at least for this work, and nothing will be gained by postponing any construction projects, it is declared. Before making its report, and as part of its study, the committee held several meetings with construction and labor men, at which all phases of the situation were discussed with a view to determining whether there appeared to be any possibility of lower costs for any part of the work.

"The country at large is two years behind in building," it is declared in the report, "which cannot be long delayed and which, when started, will be reflected in a tremendous demand for materials and labor.

"Therefore, we believe, and recommend, that necessary building operations in Washington be immediately resumed and hurried to completion before the great volume of necessary construction throughout the country, such as railroad, highway, public, semi-public and industrial development that must go on, and which when undertaken will have a tendency to increase rather than decrease the present cost of building."

The committee took up various building and construction materials one by one for discussion, the following being the report on those materials of interest to the rock industry:

Cement: Manufacturers offer to cooperate in every way possible and agree to figure same percentage of profit as prevailed under pre-war conditions, regardless of increased overhead and other charges now prevailing, and will use their good offices to induce keeping of construction costs down to lowest possible figure.

Finance: The committee finds there is a willingness on the part of financial interests to loan money on a basis consistent with sound business principles, which means that while loans will not be made in full proportion to present costs, they will be made to an extent considerably in excess of pre-war valuations.

Freight rates: It is the opinion of your committee that the increased freight rates now prevailing upon building materials contribute in very large measure to the high cost of building construction today and, further, that the rates prevailing constitute a serious deterrent influence to the revival of building work. Your committee cannot too strongly recommend that this matter be brought to the attention of the proper authorities and relief sought from the condition mentioned.

Chicago Sand and Gravel Prices Startlingly Low

IN THE FACE of a demand present and developing on account of the Lincoln, Dixie and other highway contracts, the Chicago prices for sand and gravel became chaotic two weeks ago and have since continued. Several dealers have exclaimed to a ROCK PRODUCTS representative: "Too many are selling at a loss." Some admit they are selling virtually at cost.

Prices as low as 30 cents a cu. yd. at the pit have been made, it is reported, and 35 cents seems to be the top price under the competitive bidding which road contractors have succeeded in directing to suit their ideas of price.

Through it all several producers maintain they are holding out strictly for a "living" price and will not sell at 35 cents. It is admitted by all that 35 cents is not profitable; fifty cents is claimed as the minimum price that will permit continued existence of business, but for a successful business, the price ought to be 60 to 75 cents. A contractor told a producer that 60 cents should be the minimum figure.

Prices f. o. b. cars, initial railroad line, Chicago, run around $1.25 a cu. yd.

Car Shortage Coming Again? Well, Maybe It's a Mistake

A NORTHWESTERN RAILROAD official told a Chicago producer recently that renewal of coal shipments on a larger scale will begin about July 1 and that the supply of open-top cars will become a struggle again. He said that virtually no coal is being shipped now, but as soon as the public realized there will be no reduction in price, the consumers will begin to stock up again for next winter. Then the demands for cars for coal and the expected growing demand for cars for road material will bring about a "shortage," he said.

Several mineral aggregate producers questioned the railroad man's prediction, one because farmers and others, he asserted, bought enough coal last year to last for two or three years.

The railroad man, however, says the railroads have not been building many gondola cars for several years, but have been smashing them up in the course of business. He intimated that was reason enough.

Louisville Patches Roads with Cold Gravel-Tar Mix

LOUISVILLE, KY.—Formerly gravel and tar products for road patching were mixed almost entirely on the road side in Louisville, or at some central point by the county. Lately the county has been mixing tar and gravel in a portable mixing machine in the E. T. Slider sand and gravel yard. The tarred gravel is transported for road patching and laid cold. Excellent results are being obtained and the Jefferson County roads are in better shape now than ever before known.

Through mixing at the yard there is less loss of material as a whole than if a surplus amount was carried to the scene of actual patching. The road patchers secure a cart of material, ready to lay, from the sand yard, and lay it with considerably less equipment than was used in the old days.

Awarding of Road Contracts by Illinois State Continues Steadily

Federal and State Aid Highways Rapidly Going Under Contract—Under Production of Gravel a Fact in Few Months, Says Ben Stone

WE ARE APPROACHING nearer the period of maximum production," says Ben Stone, director of the Illinois Sand & Gravel Producers' Association, in his bulletin. "Quite a number of plants are running to capacity now, although no one has a very considerable amount of tonnage booked ahead; but the great number and variety of construction projects which are rapidly developing from the embryo to a matured form furnish an abundance of confidence that by the first of June every sand and gravel plant in the state will be well supplied with business.

"There seems to be a great anxiety in some parts of the state just at this time, and we have heard some talk of overproduction, the latter being principally in the Chicago District, where there are a great number of large plants which, of course, must be kept going in order to take care of overhead expenses; but a careful analysis of the situation will determine that the over-production bugaboo is merely the result of over anxiety for tonnage.

"The road building program alone, will require such a vast amount of material that the real problem is going to be one of available supply rather than over-production.

"Contracts have already been awarded for the Lincoln Highway and a portion of the Dixie Highway, to say nothing of a great many smaller state aid roads, and Wednesday, May 21, bids were received for the Springfield-Peoria road and the Peoria-Henry Highway; and on the 28th there will be more than 56 miles let on the National and Dixie Highways, besides some 10 or 12 miles of state aid work.

"Mr. Bennett has said that he hopes to have all of the Federal aid trunk lines under contract by the first of July; the letting of state aid work will continue from week to week throughout the summer; plans now actually under way will call for the expenditure of more than $100,000,000.00 for hard roads in this state during the next two or three years.

"When we consider, in connection with the road program, the large amount of municipal work that must be done, it seems to us that the producer's real problem is to find ways and means for providing the necessary material."

Intra-State Freight Rate Case Dismissed

The matter of the Indiana and the Illinois intra-state freight rates which has been in contest the past month before the railroad administration traffic committees, has been dismissed by Director Chambers "without prejudice." This decision does not take away the complainants' right to future action.

Concrete Piling Driven 35 Ft. Into Sea Bed for Giant Causeway

GALVESTON, Tex.—Satisfactory progress is being made in constructing the giant causeway across Galveston Bay, connecting this city with the mainland. In the great storm of a few years ago, the sand fills at the two approaches were washed out and the work which is now being done is to make these ends a solid part of the remainder of the permanent causeway.

The cost of the improvement will be approximately $2,000,000. The causeway will be 12,642 ft. long and will be used for railroad, electric interurban and vehicle traffic.

The construction of the concrete archways involves the larger part of the work being done. The foundation of the footform of each arch is made of concrete piling, which are driven into the bed of the bay to a depth of 19 to 35 feet. The records show that after the concrete is poured it requires 28 days for each arch to set.

The Rock Products Market

Agricultural Limestone Wholesale at Plant, per Ton

EASTERN:

Coldwater, near Rochester, N. Y.—Analysis: $CaCo_3$, 56.77%; $MgCo_3$, 41.74%—90% thru 100 mesh; ppr., 4.50; bulk 3.00

Hillsville, Pa.—Analysis, $CaCo_3$, 85%; $MgCo_3$, 1½%—(70% thru 100 mesh) in 80 lb. ppr. bags, $4.50; bulk..... 3.00

Lime Kiln, Md.—50% thru 50 mesh; bulk 4.00

Pownal, Vt.—(50% thru 100) Analysis, $CaCo_3$, 90%; $MgCo_3$, 5%; ppr., $4.50; bulk 2.75

West Stockbridge, Mass.—(50% thru 100) Analysis, $CaCo_3$, 90%; $MgCo_3$, 5%; ppr., $4.50; bulk..... 2.75

CENTRAL:

Alton, Ill.—(Pulv. and 90% thru 50 mesh; 90% thru 4 mesh) Analysis, $CaCo_3$, 96%; $MgCo_3$, .75%..... 2.00

Bedford, Ind.—(90% thru 10 mesh) Analysis, $CaCo_3$, 98.5%; $MgCo_3$, 0.5% 1.75

Canton, O.—100% thru 10 mesh; 49% thru 100; 59% thru 50..... 3.00

Columbia, Ill., near East St. Louis —(⅛" down) ..... 1.25@1.80

Elmhurst, Ill. — (Analysis, $CaCo_3$, 35.73%; $MgCo_3$, 20.69%) 50% thru 50 mesh 1.25

Howenstein, O.—100% thru 10 mesh; 59% thru 50; 39% thru 100..... 2.75@3.00

Lannon, Wis.—(90% thru 50 mesh) Analysis, 54%, $CaCo_3$; 44%, $MgCo_3$ 2.00

Marble Cliff, O.—(50% thru 100 mesh) Analysis, $CaCo_3$, 86%; $MgCo_3$, 8%.... 3.00

Marblehead, O. — (Analysis: $CaCo_3$, 95.33%) 50% thru 100 mesh..... 3.00@4.50

McCook, Ill.—(100% thru ¼" sieve; 78.12% thru No. 10; 53.29% thru No. 20; 38.14% thru No. 30; 26.04% thru No. 50; 16.27% thru No. 100) Analysis, $CaCo_3$, 54.10%; $MgCo_3$, 45.04% 1.00

Milltown, Ind.—Analysis, $CaCo_3$, 98% 1.50

Montrose, Ia.—(90% thru 100 mesh).. 1.25@1.35

Muskegon, Mich.—(90% thru 50 mesh) Analysis, $CaCo_3$, 53.35%; $MgCo_3$, 43.27% 2.50

Piqua, O.—(50% thru 100 mesh)..... 2.50@4.00

Rockford, Ill. — Analysis, $CaCo_3$, 53.75%; $MgCo_3$, 44.35%..... 1.25

Stolle, Ill. (near East St. Louis on I. C. R. R.)—(Thru ⅛" mesh) Analysis, $CaCo_3$, 89.61 to 89.91%; $MgCo_3$, 3.82% 1.50

Stone City, Ia.—(50% thru 100 mesh) Analysis, $CaCo_3$, 98%..... .50

Toledo, O.—Analysis, $CaCo_3$, 52.72%; $MgCo_3$, 43%—(20% thru 100 mesh; 30% thru 50; 80% thru 100; 100% thru 5/32 screen)..... 1.80

Whitehill, Ill. — Analysis, $CaCo_3$, 96.12%; $MgCo_3$, 2.50%—
50% thru 100 mesh, bulk..... 1.50
90% thru 100 mesh..... 5.00

SOUTHERN:

Cartersville, Ga.—Analysis: 96 to 98% combined carbonates—All thru 10 mesh with all dust in..... 3.00

Dittlinger, Tex. — Analysis, $CaCo_3$, 99.09%; $MgCo_3$, 40%.
90% thru 100 mesh..... 2.00
90% thru 4 mesh..... 1.00

Fletcher, N. C.—Analysis, $CaCo_3$, 75%; $MgCo_3$, 22%—(all thru 10 mesh; 50% thru 100 mesh)—100 lb. paper or 200 lb. burlap, $3.60; bulk..... 2.10

Grovania, Ga.—Analysis, $CaCo_3$, 95%; $MgCo_3$, none—50% thru 100 mesh.... 2.50

Memphis Jct., Ky.—(Analysis, $CaCo_3$, 95.31%; $MgCo_3$, 1.12%) average price 2.00

(Continued on next page.)

Wholesale Prices of Crushed Stone

Prices given are per ton. F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Auburn and Syracuse, N. Y.	.80	1.20	1.20	1.20	1.20	1.20
Buffalo, N. Y.	Railroad ballast, 1.00 $1.00 per ton, all sizes					
Burlington, Vt.	.....	.....	2.00@2.50	1.75	1.75	.....
Coldwater, N. Y.	Flux, 1.50@2.10					
Lime Kiln, Md.	1.00	2.00	1.85	1.65	1.45	1.25
North Leroy and Akron, N. Y...	$1.00 for all sizes, including R. R. ballast					
Walford, Pa.	.....	1.50	1.50	1.40	1.40	1.40
CENTRAL:						
Alden, Ia.	.40	.....	1.00	1.00	1.00	1.00
Alton, Ill..	1.85	.....	1.45	1.35	.....	.....
Belvidere, Ill.	1.00 for any size produced					
Bettendorf, Ia.	1.25	1.25	1.25	1.25	1.25	(2300 lbs).
Detroit, Mich.	Various sizes $1.50 per net ton					
Dundas, Ont.	.65	1.05	1.05	1.05	.85	.85
Eden and Knowles, Wis.	.....	80	1.00	1.00	1.00	.....
Elmhurst, Ill.	(¼-in. 1.25)		1.00	(Sc'gs .85)	.85	.85
Greencastle, Ind.	.90@1.25	1.10	1.00	.90	.90	.90
Illinois, Southern	1.50	1.25	1.25	1.25	1.10	.....
Kokomo, Ind.	Price range .90@1.00					
Lannon, Wis.	1.00 all sizes					
Lewisburg, O.	.80@1.00	.....	1.00@1.10	1.00@1.10	1.00	1.00
Lima, O.	1.10 for any size					
Linwood, Ia.	.60	1.05	1.00	.91	.91	1.00
Mankato, Minn.	.....	.....	(1-in. 1.50)		(2-in. 1.25)	
Mayville, Wis.	.75	.....	.....	1.00	1.00	1.00
Montrose, Ia.	.....	1.10@1.15	1.10@1.15	1.00@1.10	1.00@1.10	.....
Oshkosh, Wis.	1.00 in all sizes, Blue Limestone					
River Rouge, Mich.	.85@1.15	1.15	1.15	1.15	1.15	1.15
Rockford, Ill.	1.25	.....	.....	1.25	1.25	1.25
Sheboygan, Wis.	1.00 for all sizes					
Sherman and Hamilton, Wis.	All sizes $1.00 per ton					
Stone City, Ia.	.50	.....	(1-in. 1.40)	1.30	1.20	.....
Toronto, Can.	1.55	1.95	1.95	1.95	1.75	1.75
	These prices include 90c freight					
SOUTHERN:						
Brooksville, Fla.	1.00	.....	.....	2.50	.....	.....
Cartersville, Ga.	.....	1.95	1.85	1.75	.....	1.65
Fort Springs, W. Va.	.75	1.00	1.40	1.60	1.30	.....
Linnville Falls, N. C.	All sizes, 1.35					
	Railway ballast 1.10 per cu. yd.					
Mascot, Tenn.	.....		1.00 (Chatts)			
Memphis Junction, Ky.	Average 1.10					
Winnfield, La.	.60	.....	1.60	1.60	1.60	.....
WESTERN:						
Atchison, Kans.	.50	1.80	1.80	1.80	1.70	1.70
	Rip-Rap, 1.30					
Blue Springs & Wymore, Neb.	.....	1.45	.....	1.35@1.40	1.25@1.30	1.20
Dittlinger, Tex.	.....	.....	1.20	1.00	.90	.....
El Paso, Tex.	.90 for all sizes					
Kansas City, Mo.	.60	1.35	1.35	1.35	1.35	1.35

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Birdsboro, Pa.—Trap	2.00	1.80	1.70	1.50	1.50	1.25
Branford, Conn.—Trap	.80	1.25	1.25	1.10	1.00	.....
Dresser Jct., Wis.	.50	1.25	1.25	1.10	1.00	.95
Duluth, Minn.	.50@ .65	1.40@1.50	1.25@1.35	1.10@1.15	1.10@1.15	1.00
Farmington, Conn.—Trap	.80	.95	.95	.90	.....	.....
Glen Mills, Pa.—Trap	1.00	1.40	1.70	1.55	1.40	1.40
Millington, N. J.—Trap	1.80	2.00	1.80	1.60	.....	.....
Morristown, N. J.—Trap	1.85	1.75	1.75	1.60	1.40	1.40
New Britain, Conn.—Trap	.80	1.30	1.25	1.25	1.10	.....
Richmond, Cal.—Trap	.50*	.....	1.40*	1.30*	.....	.....
Westfield, Mass.—Trap	.60	1.10	1.10	1.00	.90	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Brooksville, Fla.—Flint	1.00	.....	.....	2.50	.....	.....
Fair Oaks, Calif.—Cr. Bldrs.	.85	1.05	.95	.85	.85	.....
Hendlers, Pa.—Quartzite	.80	1.00	1.25	1.00	1.00	1.00‖
Little Falls, N. Y.—Syenite	.80	1.20	1.40	1.20	1.20	1.20‖
Middlebrook, Mo.—Granite	3.50	.....	1.75	1.75	.....	1.00‡
	Crusher run, 2-in. down to dust, 2.00					
So. Richmond, Va.—Granite	1.00@1.25	1.25@1.75	1.40@1.75	1.40@1.75	1.40@1.50	1.40@1.50
Stockbridge, Ga.—Granite	.75	2.00	1.85	1.85	1.75	.....
White Haven, Pa.—Sandstone	1.00	1.20	1.40	1.20	1.20	1.20

*Cubic yard. †Agrl. lime. ‖R. R. ballast. §Flux. ‡Rip-rap. a 3-inch and less.

Agricultural Limestone Wholesale at Plant, per Ton

(Continued from preceding page.)

Keystone, Ala.—(90% thru 50 mesh) Analysis, $CaCo_3$, 99.50%; $MgCo_3$, none	1.25
Mascot, Tenn.—Analysis, $CaCo_3$, 52%; $MgCo_3$, 38%.	
(80% thru 100 mesh)	2.50
(80% thru 200 mesh)	3.50
(All thru 10 mesh)	1.75
Paper bags, $1.50 extra per ton; burlap, $2.50 extra per ton.	
Tyrone, Ky.—Analysis, $CaCo_3$, 93%; $MgCo_3$, 4%—90% thru 4 mesh	1.50@2.25
Winnfield, La.—(50% thru 50 mesh)	4.50
WESTERN:	
Cement, Cal.—Analysis, $CaCo_3$, 95%; $MgCo_3$, 1% (50% thru 100 mesh)	4.00@5.00
Kansas City, Mo.—(50% thru 50 mesh)	1.10

Miscellaneous Sands per Ton at Plant

Silica sand is quoted washed, dried and screened, unless otherwise stated.

GLASS SAND:	
Bowmanstown, Pa.—Glass sand	2.50
Cedarville, N. J.—Glass	2.50@4.00
Gray Summit, Mo.—Glass	2.00@2.50
Hancock, Md.—Engine and glass	2.50
Klondike and Pacific, Mo.—Glass:	
Contracts	2.00
Carlots	2.50
Mapleton, Pa.—Glass, dry	2.75@3.00
Massillon, Ohio—Glass	3.00
Michigan City, Ind.—Glass sand	.30
Millington, Ill.—Glass	1.75@2.00
Mineral Ridge, O.—Glass	2.75
Montoursville, Pa.—Glass, green, washed	2.00@2.75
Ottawa, Ill.—Glass	2.00
Large contracts	1.75
All others	2.00
Sands, Elk Co., Pa.—Glass sand:	
Selected, green	2.50
Thayer, W. Va.—Glass	2.50@3.00
FOUNDRY SAND:	
Albany, N. Y., District—Molding	1.65@1.75
Core	1.25@1.50
Brass molding	1.65@1.75
Sand blast sand	3.25@3.75
Allentown, Pa.—Core: molding fine	1.25@1.40
Arenzville, Ill.—Molding fine	1.50
Bowmanstown, Pa.—Core	1.20
Molding, fine and coarse	1.50
Roofing pebble, washed	5.00
Cleveland, O.—Core, on car	1.00@1.25
Molding fine, on car	1.75@2.25
Molding coarse, on car	1.50@2.25
Brass molding, on car	1.25@2.00
Delaware, N. J.—Molding	1.50@2.00
Franklin, Pa.—Brass molding	1.65
Molding (gray iron)	1.50
Gray Summit, Mo.—Molding	1.50@2.50
Greenville, Ill.—Molding coarse red	1.60
Hancock, Md.—Core and brass mldg.	1.65
Kansas City, Mo.—Core	.75
Klondike and Pacific, Mo.—Molding	1.50@2.50
Hellam, Pa.—Core	2.00
Mapleton, Pa.—Molding, fine and core, damp	2.50
Molding, fine, dry	3.00
Massillon, O.—Core; molding fine and coarse; traction	2.50
Furnace lining	3.00
Brass molding	1.50
Millington, Ill.—Core, furnace lining, damp	1.50
Furnace lining, dry	1.75
Roofing	1.75@2.00
Stone sawing	2.00
Mineral Ridge, O.—Core, molding, sand blast, roofing, brass molding, etc., washed, screened	2.00
Montoursville, Pa.—Core, molding fine, traction	1.25@2.00
Brass molding	1.50@2.25
Michigan City, Ind.—Core, bank	.30@ .40
Ohio—Various points:	
Fine molding	1.75@2.00
Coarse molding	1.50@2.00
Brass molding	2.00

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Ambridge and So. Heights, Pa.		1.25	1.25	1.25	.80	.80
Attica, N. Y.	.50	.50	.50	.65	.65	.65
Boston, Mass. (wharves)	1.25	1.00	2.50	1.75	1.65	1.50
Buffalo, N. Y.	.80	.80	.75	.75	.75	.75
Buffalo, N. Y. (Niagara River)	.85	.80	.80	.75	.75	.75
Farmingdale, N. J.	.43	1.75	(Road Gr. Clay .53)		1.35	
Morristown, N. J.	.60	.60	1.20	1.00	1.00	1.00
North Wilbraham, Mass.		.60*	2.00*		1.25*	
Philadelphia, Pa.		.95		1.40		1.25
Pittsburgh, Pa.		1.25		1.25	1.05	1.05
Shaw's Land'g, Meadville, Pa.		1.00				1.00
Washington, D. C.—Wharves	.75	.75	2.00	1.40	1.20	1.20
CENTRAL:						
Barton, Wis.	.75	.70	1.00	.70	.70	.70
Beloit, Wis.		.50	.60	.60	.60	
Chicago, Ill.	F. O. B. cars, initial R. R. line, all sizes, 1.25* At pits Chicago district, .35*					
Columbus, O.	.65	.65	.60	.70	.70	.65
Des Moines, Ia.	50@1.00	.50	1.50	1.50	1.25	1.25
Drake, Mo.	.65	1.15	⅝, .90	.70		.65
Earlestead, near Flint, Mich.	.55@ .60	.55@ .60		.75@ .85	.75@ .85	.75@ .85
Escanaba, Mich.		.85	1.60	1.20	.85	.85
Fort Dodge, Ia.	1.05	1.00	1.80			1.80
Fort Jefferson and Mechanicsburg, O.	.50@ .60	.50@ .60	.50@ .60	.70@ .80	.70	.70
Grand Rapids, Mich.	.40	.45	1.00	.80	.70	.67
Greenbush, Lachine and Wing, Mich.		.35	1.25	1.11	1.00	1.00
Hawarden & Doon, Ia.		.50		(1.20, Hawarden)		1.00
Illinois, Northern	.60	.60	.60@ .70	.60@ .70	.60@ .70	.50@ .60
Indianapolis, Ind.	.50	.50		.65	.65	.65
Janesville, Wis.		.50			.60	
Mason City, Ia.	.60	.50	1.45	1.35	1.30	1.25
Milwaukee, Wis.	Railway ballast and road work, .40 1.20 for all sizes					
Minneapolis, Minn.	.40	.40	1.25	1.15	1.10	1.00
Moline, Ill.		.60	1.00	1.00	1.00	1.00
Montezuma, Covington, Ind.	.75	.75	.85	.75	.75	.75
Oxford, Mich.		.55	.90	.90	.80	.80
St. Louis, Mo., F. O. B. cars	1.35	1.20	1.50	1.30		1.25
Summit Grove, Ind.	.75	.75	.75	.75	.75	.75
Terre Haute, Ind.	.75	.75	.75@ .85	.75	.75	.75
Toledo, O.	.60 for all sizes					
Wabash Valley District, Ind.	All sizes, .75.					
Waupaca, Wis.		.35	.70	.70	.70	.70
Winona, Minn.		.70	1.60	1.10	1.10	1.10
SOUTHERN:						
Charleston, W. Va. (River)		1.20	1.30	1.30	1.30	1.30
Knoxville, Tenn.	.85	.85	1.35	1.35	1.35	1.10
Lake Weir, Fla.	.50					
Pelzer, S. C.	.55					
New Martinsville, W. Va.	1.00@1.25	.60@ .90		.80@1.00		.50@ .80
Waco, Texas	.67	.67		1.25	1.05	1.05
WESTERN:						
Kansas City, Mo.	.60	.60				
Lincoln, Neb. (on cars)	1.00	1.00	2.10	2.10		1.90
Pueblo, Colo.	.80	.60		1.50		
San Francisco, Calif.		1.15	1.15 for all grades gravel			
Seattle, Wash.	1.25*	1.25*	2.00*	1.25*	1.25*	1.25*
Sherman, Mo.	.65	.90	.90	.70	.70	.65
Vancouver, B. C.		1.10*		1.30*		1.10*

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Attica, N. Y.	.45	.45	.45	.60	.60	.60
Boonville, N. Y.	.65	.45@ .65				.60
Pittsford, N. Y.		.45@ .50	.45@ .50			
Yardville, N. J.		.50@ .75				
York, Pa.		1.00@1.10	(crushed rock sand)			
CENTRAL:						
Beloit, Wis.		.60			.60	
Chicago District	Bank sand at pits, .05 cu. yd.					
Covington, Ind.					.60	.60
Des Moines, Ia.	Washed concrete mix., 25% gravel, .70; 50% gravel, .90					
Drake, Mo.						.80
Earlestead, Mich.				.65@ .80	.65@ .80	.65@ .80
Escanaba, Mich.	1.00 cu. yd., all sizes					
Grand Rapids, Mich.	.30					.40
Greenbush, Lachine and Wing, Mich.		.50	.50	.50	.50	.50
Indianapolis, Ind.	Washed concrete mix, .55					
Janesville, Wis.					.55	
Moline, Ill.	.80					
Oxford, Mich.					.85	
Summit Grove, Ind.	.50 for all sizes					
Terre Haute, Montezuma, Ind.					.60	.60
Toledo, Ohio						.55@1.00
Wabash Valley District, Ind.	.60 for all sizes					
Waupaca, Wis.						.40
Winona, Minn.	Pit run gravel under 2-in., .70					
SOUTHERN:						
Howcott, La. (50% and up in rock content)						.65
Lindsay, Tex.	1.25			.44		
Waco, Texas				(Road Gravel)		.38@ .48
Rosenberg, Tex.	1.35*	.50*@ .75*				1.75*
Valde Rouge, La.	Sand Clay 50% metal on ⅛" screen, .60 per ton					
WESTERN:						
Pueblo, Colo.	.60	River Run, .60 unscreened				
San Francisco, Calif.		.75				

* Cubic yard. B Bank. L Lake. || Ballast.

General News From the Rock Products Markets

Pennsylvania Legislature Agitating State Quarries

A BILL to allow the State Highway Commission authority to own and operate stone-crushing plants is being considered by the Pennsylvania legislature as a means of beating down the price of crushed stone.

California Building Work Steadily Improving

OAKLAND, CALIF.—A number of the cities of California have already under way proceedings for the improvement of roads and streets. San Jose has awarded contracts for work aggregating $150,000.

In the Oakland region there are under way plans for numerous industrial and manufacturing plants. The shipbuilding activity on the east side of the Bay of San Francisco has apparently opened the eyes of those desiring factory locations.

The launching of two concrete ships from the Government Island Yard in Oakland Harbor was scheduled for about May 20.

The governor has set July 1 as the day for voting on a $40,000,000 bond issue, and from the interest being taken, there is every reason to believe that the election will carry. The building of these highways will open many sections not now accessible to the farmer and motor transportation companies.

Prices for rock, sand and gravel remain about the same as at the beginning of the year. These prices apparently do not interfere with building operations, since contractors are beginning to realize that the prices quoted are reasonable and correct.

Maryland to Spend About $236,000 on Highways

WASHINGTON, D. C.—The construction of a permanent highway to cost about $236,000 has just been inaugurated in Maryland, where a number of highways are to be built in Prince George county. The work expected to be completed by September 1.

The most extensive undertaking is the construction of 11 miles of 3-ft. concrete shoulders, which will make the present 14-ft. roadway 20 ft. wide. This work alone will cost $110,000.

The lowest of the bids recently opened by the county commissioners for the construction of 1.1 miles of concrete highway leading from Mt. Rainier was that of Costigan and Murphy, of Washington, and was for $47,407.

Work is now under way on the Defense Highway between Bladensburg and Annapolis, 1.63 miles, to cost $50,530.

Small Appropriation for Street Work in District

WASHINGTON, D. C.—Unless Congress comes to the rescue at an early date, new street work in the District will be completely halted during the fiscal year 1920, which begins July 1, next. The appropriation measure which was before Congress when that body adjourned in March made no provision whatever for new streets and authorized an appropriation of only $50,000 for sidewalks, under the assumption that the war would be in progress at the present time and that appropriations made for street work this year would not be exhausted. Concrete streets cost about $2 as compared with $1 formerly.

Nitrate of Potash to Be Imported Freely

WASHINGTON, D. C.—The War Trade Board announces that on and after July 1, 1919, nitrate of soda and nitrate of potash will be permitted to be imported into the United States without restriction under a general import license when coming from countries with which general trade is authorized.

Importers are advised that any shipments of nitrate of soda or nitrate of potash which arrive prior to July 1, 1918, will not be released for entry until such date, except under individual import licenses as now required, and that such licenses will be issued only in accordance with the present rules and regulations governing the importation of these commodities.

Building Boom About to Begin in the East

THE LIME ASSOCIATION reports that two architectural firms in New York have 52 different operations on their boards at this time, for many of which plans and specifications are about completed. Others are in the preliminary stages of closing the contracts. The association manager feels that a tremendous building boom is about to begin.

Portland Cement Concerns Organize Export Co. in the East

PHILADELPHIA—Ten Portland cement manufacturers, having an aggregate productive capacity of 14,000,000 barrels annually, have joined in the organization of the Cement Export Company, Inc., a Delaware corporation registered under the Webb act for the purpose of exporting cement.

Miscellaneous Sands per Ton at Plant

(Continued from preceding page)

Ottawa, Ill.—Brass molding	2.00@2.50
Ottawa, Ill.—Core, Steel Molding	1.75@2.00
Ottawa, Ill.—Core, furnace lining, molding	.65
Sand blast	2.50
Stone sawing	1.25
Ottawa, Ill.—Roofing	1.75@2.50
Ottawa, Ill.—Sand blast sand	2.75@3.50
Ottawa, Ill.—Sawing sand	1.50@3.50
Ottawa, Ill.—Traction	1.75
Ottawa and Utica, Ill.—Furnace lin'g	.85@2.00
Molding, selected	1.50@2.50
Molding, coarse	1.75
Thayers, Pa.—Core and traction	2.00
Wedron, Ill.—Molding	.75@1.00
West Albany, N. Y.—Molding fine	1.75
Molding coarse	1.75
Brass molding	2.25
Thayers, Pa.—Molding, fine	1.00@1.25
Molding, coarse, furnace lining	1.00

Ground Gypsum Rock, per Ton, at Plant

Castalia, O.—Raw rock, crushed, bulk, at 3.00; ground at, bulk	3.50
Fort Dodge, Ia., bulk	3.00
Garhutt, N. Y., in bags	6.00
Grand Rapids, Mich, bags	6.00
Oakfield, N. Y.	6.00
Sandusky, O.	6.00

Jute sacks, $3.00 extra; paper, $1.00 extra.

Ground Rock Phosphate at Plant, per Ton

Centreville and Gordonsburg, Tenn.—B. P. L., 72% lump rock, ton, 2,240 lbs.	6.00@7.00
Centreville, Tenn.—B. P. L., 65% to 70%	7.00@10.00
Jacksonville (Fla.) District—Soft phosphate	10.00@12.00
(Add 2.50 for sacks)	
Mt. Pleasant, Tenn.	6.50@7.50
Mt. Pleasant, Tenn.—B. P. L., 70% washed (90% thru 100 mesh)	8.00
In 200 lb. burlap bags, 2.50 extra.	
Nichols, Fla.—Pebble—B. P. L. 67%	8.00@10.00
Phoslime. Fla.—Soft	14.00@17.50
Walls, Tenn.—B. P. L., 70%	7.50@7.75

Crushed Slag Wholesale at Plant Per Ton

City or shipping point	Roofing	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:							
Buffalo, N. Y.	1.45			Other sizes, .85@1.45			
E. Canaan, Conn.	3.00	1.00	3.00	1.15	1.10	1.05	1.00
Ensley, Ala.	2.05	.90		.90@1.20	1.00	.90	.85
Philadelphia Dist.	2.00@2.50	.75	1.50	.85	.85	.85	.85
Pittsburgh Dist.	2.00@2.50	1.00	1.50	1.00	1.00	1.00	1.00
Sharpsville, Pa.	1.75	1.00	1.25	1.00	1.00	1.00	1.00
WESTERN:							
Chicago, Ill.	All sizes, $1.50, F. O. B. Chicago						
Detroit, Mich.	All sizes, 1.65, F. O. B. Detroit						
Toledo, O.	All sizes, 2.00, F. O. B. Toledo						
Youngstown, Dover, Hubbard, Leetonia, and other Ohio points	1.75	1.00	1.25	1.00	1.00	1.00	1.00

Passed By The Screens

Incorporations

Dallas Gravel Co., Dallas, Texas. Capital, $100,000.

Orange Quarry Co., 77 River St., Hoboken, N. Y. Operate quarries. Capital, $100,000.

Aldham Stone Co., Wilmington, Del. The quarrying of slate, stone, etc. Capital, $50,000.

Wheeling Sand & Gravel Co., Wheeling, W. Va. Capital, $100,000. Organized by Daniel C. Hunt and others.

C. B. Sand and Block Company, Akron, O. Capital, $20,000. G. W. Bellamy, W. E. Bellamy, B. M. Tupper, C. B. McDowell and J. Fred Smith.

Stanley Equity Exchange, Stanley, Wis. O. Samuelson, G. W. Schmidt, W. H. Scott, incorporators. Capital, $50,000. Retail lumber and building materials.

Piedra Rock & Sand Co., Fresno, Calif. Directors: K. W. and A. R. Kerstetter, Frank R. Henry, Wm. Y. Jastram, Lewis H. Smith, Forsythe Bldg., Fresno, Calif. Capital, $20,000.

The Montreal Portland Cement Co. Ltd. Capital, $2,000,000. The promoters state that a site of 52 acres has been secured at Pointe-aux-Trembles, near Montreal, and that it is proposed to erect a plant of 5,000 bbls. a day capacity, the plans having been prepared.

Ripon Limestone Co., Ripon, Wis. Capital, $15,000. Wm. Kroll, F. T. Chittenden, J. W. Wright, H. A. Cody, Roy E. Reed. To operate a stone quarry, stone crushing plant, deal in wholesale and retail stone, powdered and crushed stone, building stone, sand, gravel, cement work, etc.

Mahar Bros. Slate Co., Inc., at Fair Haven, Vt., incorporating the business of Mahar Bros. Slate Co. which has hitherto been conducted as a co-partnership. Capital, $150,000. The incorporators are George M. Mahar of Castleton, Vt., and Edward F. and Thomas D. Mahar of Fair Haven.

Quartzite Quarries, Inc., Luverne, Minn. Manufacture and deal in road and building material of every kind and description; to quarry stone, construct pavements and roads; construct own and sell accessory railroad tracks and power conductors, etc. Capital, $200,000. Incorporators: J. E. Treat, John P. Coffey, S. A. Coss, A. A. Anderson, Wm. Jacobsen, Harper Shaffer, Frank F. Michael, all of Luverne.

Quarries

S. G. Goode and William Pipes of Danville, Ky., are arranging to engage in the crushed stone and building stone business.

The General Crushed Stone Co., LeRoy, N. Y., is adding a new 48 x 60-in. Traylor jaw crusher to its plant in this place. The crusher is to be located in the quarry to the west of the present dumping hopper and incline to the quarry plant. (See Rock Products, December 18, 1918 for description of this quarry). A pan conveyor will carry the discharge to a bin over the cable-car skips. This crusher and conveyor will be driven by a motor. A 250-h. p cross compound engine and a direct-connected generator have been added to the power plant equipment; also a 150 h. p. boiler. The new unit is so arranged that it can be used or not without interfering in any way with the present layout.

Cement

The Clinchfield (Va.) Portland Cement Co. has increased its capital stock to $2,250,000. Enlargement of facilities is to follow.

As receiver for the New Egyptian Portland Cement Co., which operated a plant at Fenton, Mich., (capacity of 1,500 barrels daily), the Security Trust Co. is notifying creditors that interests represented by John Gillespie, former police commissioner of Detroit, have submitted an offer to take over the insolvent company, subject to its bonded indebtedness of $200,000, and pay the creditors 27 cents on $1 on their approved claims. The unsecured claims amount to approximately $150,000. The matter is before Judge A. J. Tuttle of the United States court. The cement company receivership dates from February, 1918.

Personals

S. Ralph Andrews, president of the Charlestown Sand & Stone Co., of Elkton, Pa., was taken to a Baltimore hospital recently for a serious operation.

Henry Angel, general manager of the Kelley Island Lime and Transport Co., Cleveland, O., is now one of the directors of the Cleveland Builders' Exchange, having been recently appointed. Mr. Angel is well known among building material men of the country; he was formerly with the Cleveland Builders' Supply Co.

Fred W. Wells has been appointed assistant engineer of the New York district office of the Stephens-Adamson Mfg. Co. of Aurora, Ill. Mr. Wells was associated with this company prior to his entering the service early in 1918. He

A. V. Price, purchasing agent, Kelley Island Lime and Transport Co., Cleveland, recently appointed

was appointed first lieutenant in the 26th engineers, served in various sections of France and with the first army during the Argonne-Meuse operation.

F. X. Meehan has been appointed advertising manager of the Walter A. Zelnicker Supply Co., St. Louis. Mr. Meehan has had a very broad experience, having been associated, in various executive capacities, with Fairbanks Morse & Co., for six years; A. T. & S. F. R. R. Co. coast lines, for two years; and St. Louis Smelting & Refining Works of National Lead Co. for two years. Mr. Meehan was a Four Minute Man during the World War, having made over 500 patriotic speeches.

Manufacturers

Steacy-Schmidt Mfg. Co., York, Pa., recently shipped a Keystone lime kiln to The Miranda Sugar Co., Oriente, Cuba, and will soon send one to the Melchior Armstrong Co., Desau, Cuba.

The McMyler-Interstate Co., Bedford, O., has opened an office at Seattle, Wash., in the Hoge building, with W. R. Hendrey in charge. The territory covered by this office includes the states of Washington and Oregon and the northern part of Idaho.

Sand and Gravel

A sand plant costing $50,000 is being erected in Dillies Bottom on the Potts farm, Mandeville, just below Belmont Park, W. Va.

The Bridgeport Wall Plaster Co. of Bridgeport, W. Va., has closed contracts to supply 10,000 cars of sand and gravel for consumers in their district, according to the Wheeling Intelligencer.

The Rodgers Sand Co., Pittsburgh, Pa., has been unable to use its Squaw Run harbor on account of the break in the Aspinwall dam. The J. K. Davidson Brothers Sand Co. also has been compelled to dredge for sand and gravel in the Ohio river, on account of being unable to navigate the upper Allegheny river pools.

Imperial Valley Sand & Gravel Co., of Brawley, Calif., recently incorporated by Messrs. Charles Applestill, Harry Barker and E. S. Lack, expects soon to begin working a 400-acre tract near Signal mountain. Contracts have been let for a fleet of trucks to haul sand from the pits. The company is also prospecting for oil, and if found, will develop that also.

Two Illinois sand and gravel plants have been closed down part of this month, because of labor troubles. Ben Stone of the Illinois Association reports that common labor at these plants is demanding 60 cents per hour for an eight hour day with time and a half for over time and double time for Saturday afternoons and holidays. The rate paid at these plants has been 40 cents per hour.

Massaponax Sand & Gravel Corp., of Fredericksburg, Va., which was organized several months ago, has completed its plant at Massaponax, Va. Machinery has been installed as follows: Two draglines, three locomotives, standard hopper cars, steam shovel and four-yard dump cars. The capacity of the plant is said to be 40 cars a day. Officers are Chas. L. Ruffin, president and general manager; George M. Davis, secretary and general superintendent.

Retail Dealers

Fisher Building Supply Co., Milwaukee, Wis. Increase of stock from $10,000 to $25,000. Dealers in lime, cement, clay products, all building materials.

Hutter-Lewis Co., Fond du Lac, Wis. Capital, $15,000. Geo. F. Hutter, 343 E. Division St., Fond du Lac. Dealing in lime, cement, brick, stone, lumber. Building and construction company.

D. T. Riffle, first vice-president of the Pittsburgh Builders' Exchange, and J. P. Eichleay, a member, were elected to membership on the board of directors of the Pittsburgh Chamber of Commerce.

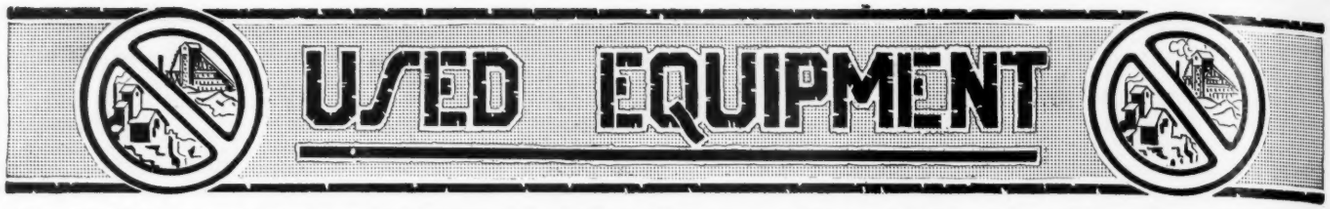
A. E. Reister, of Reister & Thesmacher, has been elected president of the Cleveland Builders' Exchange and E. M. Carleton of the Mills-Carleton Lumber Co., vice-president. The indefinite absence of the former president, C. W. Lundoff, in Europe, made the election necessary.

Gypsum Products

The Bloomingdale Cemetery Association, says an Akron, N. Y., dispatch, has closed a contract with the American Cement Plaster Co. for the sale of the gypsum rock underlying the cemetery at a depth that will not affect the surface, as vouched for by both the company and the State mining authority. Protests have been made by people owning lots in the cemetery. The controversy undoubtedly will be dropped.

Lime

The East Sparta Clay and Lime Co. of East Sparta, O., recently incorporated, are manufacturing hydrated lime for agricultural purposes. At present their production capacity is eight tons of lime daily. The president is D. A. Cable; general manager, S. S. Fry; secretary, F. A. Easterly.



Rates for advertising in the Used Equipment Department: $2.50 per column inch per insertion. Minimum charge, $2.50. Please send check with your order. These ads must be paid in advance of insertion.

ATTENTION QUARRYMEN!

While we deal largely in STEAM SHOVELS, LOCOMOTIVES, CARS, RAILS, LOCOMOTIVE CRANES, COMPRESSORS, HOISTS, ETC., we are at present specializing in

STONE CRUSHERS

Our holdings represent over 50 high-grade released machines and include crushers of the Gyratory Type from size No. 2 to No. 21; Jaw Type from 8x14″ to 60x84″; also several Symons Disc and Crushing Rolls.

Hold off buying that new machine until you learn what we can do for you--the chances are that you will be agreeably surprised

WM. B. GRIMSHAW CO., 1048 DREXEL BLDG. PHILADELPHIA, PA. **"Dealers in *Used* but *Not Abused* Machinery"**

CRUSHERS

1 No. 4-C Symons Gyratory.
1 No. 6 Austin Gyratory.
1 No. 7½ Austin Gyratory.
1 No. 8 Gates Gyratory.
1 16 x 24 Buchanan Jaw.

BOILERS

1 66 x 16 Horizontal Tubular.
1 72 x 18 Horizontal Tubular.
3 125 h.p. Locomotive Type.
1 275 h.p. Heine Water Tube.

WIRE ROPE

10 pcs. 1⅝-in. Plow Steel, 650 ft. lengths.

Get Bulletin 250—(250,000 Circ.) 88 Pages

Rails, Cars, Locomotives, Steam and Electric Hoisting Outfits, Air Compressors, Electric Plants, Road Rollers, Concrete Mixers

ZELNICKER IN ST. LOUIS

PRIVATE EQUIPMENT

5 miles Koppel 24″ gauge track
40 Koppel steel cars, 24″ V shape, 1½ yd.
60 Western cars, 24″ gauge, 1¼ yd.
55 cars, 24″ gauge, all steel, flat top
3 locomotives, 24″ gauge
150 tons 16 lb. relayers with splices
2 Koppel locomotives, 24″ gauge

D. B. Straley, Crown Point, Ind.

WANTED

Rotary Dryer, 48″ to 60″ diameter by 50 or 60 ft. long, coal fired. Send price f. o. b. cars and complete description.

CONSOLIDATED PHOSPHATE CO.
Columbia, Tennessee

FOR SALE

No. 12K Gates crusher, Manganese fitted, nickel steel shaft, **$5750.00.**
1—2500 ton crushing plant, Mang. fitted, with Corliss engine drive.
2—1500 cu. ft. air comp. (steam) Duplex.
20—Crushers, No. 3 to 12.
1—312 Kva. 240-480 V. 60 Cy. 3 Ph. non. Cond. Turbo, used 2 yrs. Ex. & S. B.
1—150 Kw. 125-250 V. Dir. Cur. Turbo.
1—110 Kva. 240-480 V. 900 Rev. G. E. generator, Ex. and S. B.
2—300 H.P. 180 lb. Water Tube Boilers, **$9.00** H. P. Piping, etc.
1—400 H. P. 180 lb. H. R. T.-W. T. boiler, stoker, **$9.00** H. P.
1—50 H. P. Loco. boiler, 140 lb. **$750.**

ROSS POWER EQUIP. CO.
Indianapolis Indiana

FOR SALE

1 Beal core drill in good condition.

The Fredonia Portland Cement Co.
Fredonia, Kansas

You are reading this ad. So are others. That is why it will pay you to advertise your used machinery in these columns.

FOR SALE

one 18-inch Bonnot Pulverizer, strictly first class order, immediate shipment

John D. Owens & Son Co.
Owens, Ohio

WANTED

10 36″ gage V shape all metal 2-way rocker side dump cars. Send full description, photographs, price. Address

Box 1308 Care Rock Products

RAILS

All sections of new and second-hand, on hand for quick shipment. Also purchase old and abandoned plants for dismantling purposes.

M. K. FRANK, Pittsburgh, Pa.

FOR SALE

Climax locomotive, geared, standard gauge, 35 ton, fine condition
Compressor, Sullivan, 650 ft., steam
Compressor, Laidlow Dunn Gordon, belt driven, 420 ft.
10 Western cars, 36″ gauge, 4 yd. steel underframe
2 Holt caterpillar tractors
Drag line, 50 ft. steel boom, ⅝ yd. dipper

Lock Box 205 Crown Point, Ind.

Idle Machinery Absorbs Profits

This department is the medium for the men who keep the wheels going. Sell your idle machinery to the man who'll keep it going.